

COMPUTERWORLD

COO/CIO Crossfire



DOUG MILLER/GAMMA LIAISON

Re-engineering requires a fruitful relationship between the COO and CIO. But as Timothy Edwards, COO at Matewan National Bank, points out, that relationship can be anything from nonexistent to outright hostile.

—SEE MANAGEMENT, PAGE 87

Radical shift for IBM PCs?

Plan is to perk up, unify product lines and deliver technology faster

By Michael Fitzgerald
and Stephen P. Klett Jr.
SOMERS, N.Y.

The IBM PC Co. is planning what appears to be a significant overhaul of its desktop strategy that could result in a more unified approach to its PS/2 and ValuePoint lines. The shift could also help the company bring technology to market faster, officials said last week.

The new strategy is expected to be announced Thursday, sources said, though they cautioned that the plans are not final.

Spurring the shift are internal concerns that the PC Co.'s corporate desktop strategy comes across as "dull and boring and maybe even drunk and disorderly," said Anthony E. Santelli, president of the company's product group.

Santelli said he would like to see his PCs generate the same enthusiasm as the ThinkPad

Family affair

IBM PC Co. currently offers five major brands: the **ThinkPad** portable line, **PS/2** and **ValuePoint** desktops, and the **PS/1** and

Ambra lines of portables and desktops. This may change significantly as the company begins to rethink how its products hit — and miss — the market, and it begins undertaking changes.

line of notebooks.

Santelli and other PC Co. executives said in interviews here last week that the desktop revisions will come as part of an overall rethinking of their brand strategies. For example, the executives said they also plan to expand the company's mobile computing strategy (see story page 4).

It's about time

Users and analysts called the shift long overdue.

"IBM has been lacking a PC strategy for several years," said Robert Holmes, manager of systems evaluation at Southern California Gas Co. in Los Angeles. "They've done a good job of creating confusion to the benefit of others — specifically Compaq and Dell."

Some users said that depending on what IBM
IBM PCs, page 14

Group seeks open document access

By Ellis Booker
LOS ANGELES

■ An object-oriented initiative designed to enable enterprisewide document management received significant backing last week from more than 20 large users and vendors. They hope it will simplify access to documents stored across the enterprise.

At the Documentation '94 show last week, the Shamrock Document Management Coalition said it is trying to define cross-platform application programming interfaces that will initially provide users with consistent and transparent access to directory services and formatted documents across networks. A later version of the API will offer similar interfaces to a mix of software products such as word processors, electronic mail and groupware systems.

Currently, most document management systems use proprietary formats and directory structures. That presents a particular problem for users who have multiple document managers installed and who need to exchange documents among them.

Shamrock, page 15



The vendor side of the Shamrock group includes Adobe Systems, Inc., Andersen Consulting, Electronic Data Systems Corp., Frame Technology Corp., Hewlett-Packard Co., IBM, Interleaf, Inc., Microsoft Corp., OpenVision Technology, Saros Corp., Sybase, Inc., ViewStar Corp. and Wang Laboratories, Inc. All have agreed to support the APIs once they are published.

Office no threat to Notes

Oracle groupware has yet to meet far-reaching promises

By Kim S. Nash

Oracle Corp. will not make good on promises to compete with Lotus Development Corp.'s Notes groupware until it adds document management, support for electronic-mail standards and other key features to its office automation product, users said.

Early users of Oracle Office 2.0, which shipped last month, said the product improves on previous versions with integrated E-mail directory services. However, as it
Oracle, page 16

Catch-up game

A lack of document management features means that Oracle Office 2.0 does not yet add up to Lotus-style groupware

	ORACLE OFFICE 2.0	LOTUS NOTES
Key features:	• Electronic mail with directory services • Meeting, project scheduler • Word processor add-ons such as spelling and punctuation checkers	• Application development tools • Document management features • User-defined data replication
Price:	\$150 per seat (does not include price for Oracle 7)	\$495 per client and/or server license

IBM to dovetail software prices across hosts

By Craig Stedman
ANAHEIM, CALIF.

When IBM introduces its parallel processing mainframes this spring, it is also expected to unveil a mainframe software pricing plan that is likely to lower costs for its existing host users.

At the Share, Inc. users' conference last week, IBM executives said they plan to make software prices similar on the parallel mainframes and existing ES/9000 machines, even if the parallel models are made up of multiple system



Share President John Chapman: Parallel mainframes will enable large CICS installations to be split

images. Today it costs more to buy multiple small systems than one mainframe with the same aggregate performance.

However, with time ticking away to the expected formal introduction of the first parallel machines in early April, IBM has not resolved one thorny issue. That is, how to change mainframe software prices without causing further damage to its declining large systems revenues.

"We're still kind of working our way through" the software pricing
Mainframes, page 10

SOUND OFF!

"Object-relational models have little experience with handling objects."

SunSoft's
R. G. G. Cattell



DBMS Debate: Object vs. Object Relational

See In Depth, page 108



"Pure object DBMSs are mere pretenders to the DBMS throne."

Montage Software's
Michael Stonebraker

PHOTOGRAPH BY WILLIAM MERCER MCLEOD

NEWS

■ **Stac Electronics'** legal victory over Microsoft means data compression will no longer be included in DOS. *Page 4*

■ **Compaq** readies new LTE Lites as IBM struggles to come up with ways to ship new ThinkPads. *Page 4*

■ **WordPerfect** plans to support rival Microsoft's MAPI standard in its Office communications package. *Page 6*

■ Users will see hardware for a new form of 100M bit/sec. networks appear throughout the second half of this year. *Page 8*

■ **IBM** is revamping its RS/6000 Unix line with PowerPC technology, including a new Unix portable being introduced this week. *Page 12*

■ **Microsoft** plans to ship beta versions of Chicago (Windows 4.0) to hundreds of thousands of users this summer. *Page 14*

■ **Borland** extends Obex capabilities beyond its internal products. *Page 16*

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■ Some IS managers question the logic in eliminating floppy disks from PC shipments. *Page 39*



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CW GUIDE TO WORKFLOW

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■ **Xsoft's InConcert** gets good technical marks in FiringLine, but its reliance on Unix makes it somewhat unfriendly. *Page 100*

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COMMENTARY

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■ **Esther Dyson** and her readers say keep government out of the information infrastructure. *Page 35*

■ **Jeffrey Henning** warns that IS has to deal with new support challenges as portable computers drive employees into the 7-day, 24-hour workweek. *Page 39*

■ **Michael Ault** advises users to take a hard look at their applications before converting to two-phase commit methodology. *Page 73*

■ **Charles Babcock** examines Borland's Interbase strategy. *Page 6*

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Executive Briefing

Workflow is no longer just a subset of imaging. Especially with new object-oriented versions, people are now turning to this technology as a cross-enterprise way of getting people, applications and documents in order. *Page 97*

Chief operating officers and chief information officers need to work in harmony if successful re-engineering projects are to stay on target. Too often, however, the two are getting caught in each other's crossfire. *Page 87*

The Shamrock initiative, which promises to ease enterprise-wide document management with object-oriented technology, won endorsements from more than 20 large users and vendors. *Page 1*

IBM will revamp prices for MVS and other mainframe software so customers can cost-effectively link multiple system images in System/390 parallel processors. *Page 1*

As corporations implement distributed computing strategies, they will have to deal with some extra costs in the form of additional personnel on their technical support staffs. Meanwhile, the popularity of portable computers has created the need for new support strategies and new ways of managing employees, who may be working at any time of night anywhere in the world. *Page 39*

Network administrators say the headaches of deploying Novell's NetWare 4.01 are outweighed by advantages such as the global log-on capability. *Page 65*

Experts say the information highway is not going to get paved without back-breaking work from information systems managers, and the scramble is on to sign up top talent. *Page 29*

Congress will consider a data privacy bill that curbs the sale of driver records, but there's lots of opposition. *Page 29*

Potential problems with reliability of data and performance persuade managers to steer clear of allowing decision support queries against production databases when implementing data warehouse plans. *Page 73*

The new spin on short-term help: Agencies take on some aspects of the outsourcer's role within the data center. *Page 74*

The smart card industry meets resistance as it tries to get into the health care reform act. *Page 24*

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Notebooks march in like lions

By Michael Fitzgerald

■ **Two of the Top 4 players in the notebook market will soon introduce significant new products, with Compaq Computer Corp. readying a replacement for the LTE Lite line and IBM PC Co. officials promising to expand the ThinkPad line.**

On March 7, Compaq is expected to announce an LTE Lite follow-on that may steal ThinkPad's thunder. The ThinkPad is positioned to become the top-selling portable line, if only the IBM PC Co. can meet demand for it, analysts said.

The new Compaq notebooks may draw a slew of customers who are stuck in ThinkPad supply limbo, provided Compaq can avoid its own supply morass, the analysts added. Like the rest of the industry, Compaq has had problems meeting demand for its high-end color notebooks.

"This really keeps the pressure on IBM, and some users will definitely shift over to Compaq," said Andrew M. Seybold, editor in chief of the newsletter "Outlook on Mobile Computing" in Brookdale, Calif.

The 6.6-pound products will include several firsts for Compaq in a high-end notebook, including PCMCIA slots and a 9½-in. thin film transistor (TFT) active-matrix color screen, as well as an integrated AC adapter, according to sources briefed by the company. The models will be based on Intel Corp.'s 20/40-MHz and 25/50-MHz DX2, and a new 25/7-MHz DX4.

"PCMCIA is a big deal, and the built-in adapter is great," said Edward B. Fernstrom, MIS director at DynCorp in Reston, Va. DynCorp is largely a Compaq shop, and Fernstrom said he has been waiting for a refresh to the LTE Lite line, particularly PCMCIA capability.

A new Compaq notebook with an SL enhanced 25-/50-

MHz Intel Corp. i486DX2, the new 9½-in. TFT active-matrix color screen and a 340M-byte hard drive will cost some \$5,300, the sources said. By contrast, Toshiba America Information Systems, Inc. offers a T4700C with an active-matrix color screen, a 50-MHz DX2 and a 320M-byte drive for \$5,699.

Compaq will also offer a convenience station that will load and eject the notebook like it was a VCR cassette, a function Compaq demonstrated at last week's Windows Hardware Engineering Conference.

Compaq will also include local-bus video, an optional 510M-byte hard drive and an enhanced trackball. It will also have an 8½-in. TFT color, passive-matrix color and active-matrix monochrome screens.

IBM responds

However, the PC Co. will counter-punch quickly, as it did this week when it cut prices on its ThinkPad 500 subnotebook in response to Compaq's Aero subnotebook.

ThinkPad officials interviewed at PC Co. headquarters in Somers, N.Y., last week said they were readying a variety of new products designed to fix some of the company's supply problems.

While they stopped short of saying they would catch up to demand before midyear, "we will have answers to the supply problems this half" that will ease backlogs

Mixed views

141 users of color notebooks from AST Research, Inc., Compaq, IBM and Toshiba rate varying levels of satisfaction with key features

MOST SATISFIED

9.3 Software compatibility

8.4 Reliability

8.1 Portability

7.9 Quality of color display

7.9 Processor performance

7.9 Hard disk performance

LEAST SATISFIED

7.3 Availability of peripherals

7.3 Expansion options

7.1 Responsiveness of service

7.0 Battery life

7.0 PCMCIA card support

6.6 Bundled applications

SCALE: 1 TO 10, WHERE 10 IS BEST

Source: June 28, 1993, Computerworld Buyers' Satisfaction Scorecard

faster than anticipated, said Scott L. Bower, the PC Co.'s director of mobile computing brands.

Those answers will include expanding the ThinkPad line to include smaller active-matrix color screens rather than the hard-to-build 10.4-in. version now on ThinkPads, said Joseph C. Formichelli, the PC Co.'s new general manager of mobile computing. Sources said the PC Co. will ship ThinkPads with an 8½-in. TFT color screen made by Sharp Corp. in the second quarter.

IBM is scurrying to find other sources of color screen production, in part because it expects 90% of its notebook shipments will be color by year's end, Bower said.

The news that the PC Co. expects to ease its backlog situation pleased users contacted.

Enrique Crespo Jr., manager of corporate sales systems at The Torrington Co. in Torrington, Conn., picked the ThinkPad 750C for a sales force automation project but "had to compromise" and take the 750CS, which has a dimmer, passive-matrix color screen.

"We would love to get some active-matrix color versions, even if

the screen is smaller," Crespo said.

Finding help in odd hours of need. Page 39. **SPARC notebook manufacturer** promises workstation performance. Page 41

Copyright infringement

Ruling means DOS to lose compression

By Ed Scannell and Stuart J. Johnston

In the wake of last week's legal victory by Stac Electronics over Microsoft Corp., tens of millions of corporate users buying DOS-based systems will have to do without data compression.

That's the bad news.

The good news is that many corporate users do not seem to care too much.

Last week a jury in U.S. District Court in Los Angeles awarded Stac \$120 million in damages against Microsoft for infringing on two of Stac's data compression patents.

However, the jury also found that Stac had misappropriated and used proprietary Microsoft technology in its Stacker compression products. It awarded Microsoft \$13.7 million in compensatory and punitive damages.

Change of plans

As a result of the award to Stac, Microsoft has stopped shipping DOS 6.2 with its DoubleSpace compression technology. It will begin shipping DOS 6.21, which will contain no data compression utility, no later than this week.

Microsoft officials said they are confident they will not have to recall copies already sold to users or copies sitting on resellers shelves or bundled with OEM machines. This belief is

based on the large award that Microsoft officials said adequately compensates Stac for lost marketing opportunities.

"We think the product [DOS 6.2] in the channel should be covered by the damages award. We intend at this point to not pull anything," said Bill Neukom, Microsoft's senior vice president of law and corporate affairs.

He said users can continue to use DoubleSpace without worry.

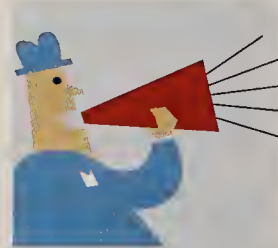
In an attempt to downplay both the importance of DoubleSpace and the payment due Stac, Brad Silverberg, Microsoft's vice president of personal systems, last week said that only 40% of Microsoft's upgrade customers use

DoubleSpace. He added that less than 20% of users who buy systems with prebundled DOS use DoubleSpace. However, last September, Microsoft officials said that some 62% of DOS 6.0 users used DoubleSpace.

In a permanent injunction filed late last week however, Stac officials asked that all copies in retail and OEM channels sold by Microsoft after Feb. 1 be removed from the channel.

Both parties have the right to request an injunction.

Similarly, Microsoft, in an injunction filed late last week, is requesting that all copies of Stacker 4.0, which just started shipping to retailers on Feb. 14, be removed from the various



Possible recall?

Novell, Inc., which recently shipped Stacker 3.1 as part of Novell DOS 7.0, refused to comment on last week's court ruling, although that ruling and the subsequent injunction may force it to recall its product. IBM's PC DOS 6.1 and the upcoming 6.3 may be the only operating systems with a bundled compression product — based on the now-defunct Adstor, Inc.'s SuperStor product — not at risk.

distribution channels.

The timing of the decision is at the discretion of the judge, but officials from both Microsoft and Stac said they expect rulings in the next week or two on the injunctions.

While Microsoft officials confirmed that approximately 80% of all copies of DOS are sold through its hardware OEMs, they contended there will be little or no disruption to the flow of DOS product to distribution channels.

No lack of storage

Users' apparent lack of concern centers mainly around the fact that most systems shipping to corporate accounts today typically have 200M-byte hard drives or larger and have enough capacity to take care of their storage needs.

Our clients "typically buy machines with 400M- and 500M-byte drives and so tend to use data compression pretty sparingly," said Bill Cornfield, president of The Windows Support Group in New York, a consultancy whose client list includes Anheuser-Busch Cos. and American Express Co.'s Gold Card division.

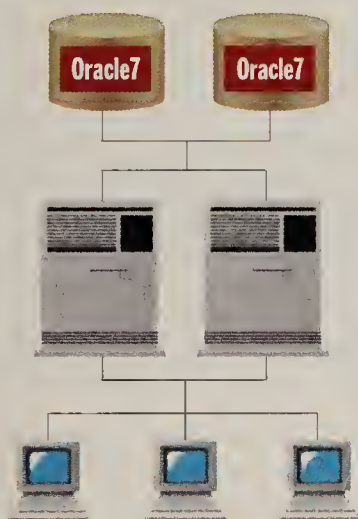
"People buying new machines now aren't buying them with data compression as a priority. It just isn't a significant factor anymore," said Mike Drips, an information systems professional at a major telecommunications company in Tampa, Fla.

However, some small to medium-size companies with much smaller budgets may be somewhat inconvenienced.

"In this case, it hurts people like us that can't buy several systems with 300M-byte drives," said Richard Pendelton, owner of a small furniture store in Raleigh, N.C.

Oracle7 Parallel Server: Breaking the Single Server Limit.

Applications built using a first-generation client/server database cannot access data on more than one server computer without a lot of extra programming. In contrast, the Oracle7 Parallel Server database enables applications to access data on multiple server computers just as if all the data was stored on a single server. Which is one reason why 9 out of the top 10 Fortune 500 companies run Oracle7 on their parallel systems.

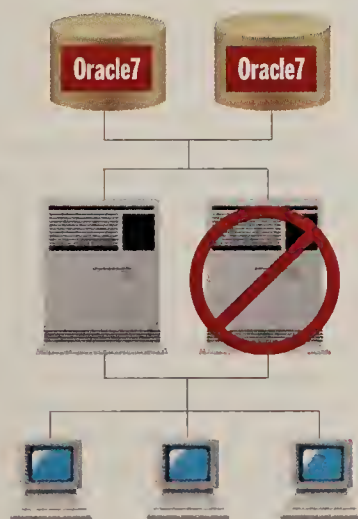
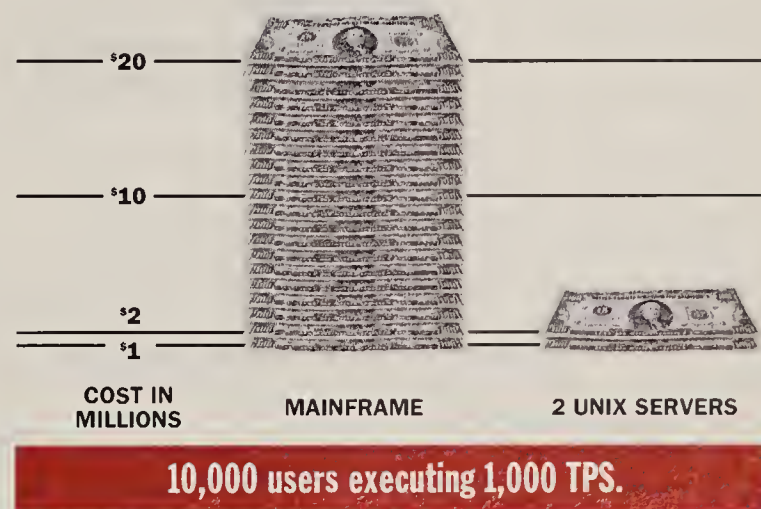


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Performance is increased simply by adding another server. Two UNIX servers running Oracle7 were independently certified as supporting 10,000 users running 1,000 TPC-A transactions per second.

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ORACLE

Preassembled client/server

Borland International has launched what it calls a shrink-wrapped solution to building client/server systems. This is an ambitious claim, but surprisingly, the design of Borland's Interbase system is distinct enough for the boast to contain a measure of truth.

Interbase is a relational database that was designed as a versioning system, which offers advantages in client/server settings. With a versioning system, the database manager responds to user queries by sending pages of data to 250K-byte blocks of memory that the system reserves for individual users. It can then respond to that user in that dedicated space, regardless of what other database users are doing.

If the user happens to be writing to the database, the system captures the changes and periodically sweeps them into the database.

Each page with newly written data is date/time stamped, with the system policing changes so updates occur in the right sequence. It is possible a reader may be working with data that is soon to be overwritten, but the read is current for the time it is requested.

One write to the database will block another attempted write for the sake of data integrity. But the more frequent blocking action in relational systems is that of an attempted write to records that are being read elsewhere. There are usually many more readers of data than writers.

Because Interbase is a versioning system, data is more accessible to users. Data is not available literally in real time, but the updates happen in rapid sequence to the changes so readers don't sit drumming their fingers, locked out while waiting for a write to finish with what they are trying to access.

Although a chunk of memory space is required for each user, system memory is less expensive today than when Interbase was launched in 1983, and given a generous memory allocation, Interbase is a broadly scalable system.

The versioning database lends itself to a mix of client/server uses, such as decision-support queries against the database while there are simultaneous transaction processing updates. Along decision-support or executive information system query will not block a transaction processing write. In most production systems, these two uses are not mixed due to contention for data and lock-out procedures.

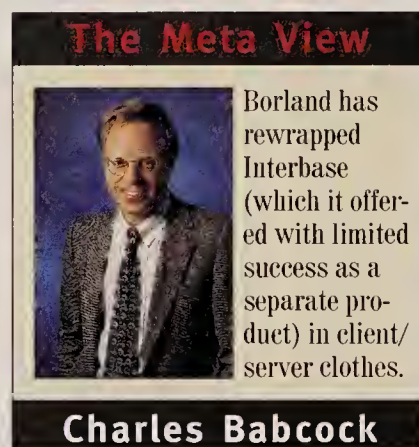
In effect, Borland has rewrapped the Interbase database management system (which it offered with limited success as a separate product) in client/server clothes. It now has links to Borland's desktop database systems, Paradox and dBase. Just how successful this "upsizing" approach will become remains to be seen, although the Philadelphia and Boston stock exchanges use Interbase because of its versioning capabilities.

So users should be aware of the special case represented by Interbase. Other database systems have versioning features, but they were not designed from the ground up as versioning systems.

Borland didn't mention versioning during its Interbase coming-out party at the Client/Server Conference in San Jose, Calif., on Jan. 20.

Chairman Philippe Kahn, with his usual sense of humor, expressed more scientific concern for the ingredients of the luncheon's chocolate cake than the underpinnings of Interbase. One had to excavate several layers of press releases to find a versioning reference.

Credit for the versioning database system should go to James Starkey, former president of Interbase Software Corp. and Interbase's author. Borland acquired Interbase in 1991 with its purchase of Ashton-Tate.



Borland has rewrapped Interbase (which it offered with limited success as a separate product) in client/server clothes.

WordPerfect eyes open Office

Company puts common interface on long-term agenda

By Lynda Radosevich

WordPerfect Corp.'s plans to build support into its Office communications package for rival Microsoft Corp.'s Messaging Application Programming Interface (MAPI) could lead to full support for Microsoft's forthcoming Enterprise Messaging Server back-end services.

Moreover, Microsoft-sponsored efforts to extend MAPI support to both the Unix and Macintosh platforms, if successful, would mean Office users could swap front- and back-end messaging services from those platforms, a company official revealed last week.

The details emerged last week in a briefing as WordPerfect wrestled to define an open client/server strategy for its corporate messaging customers, who are increasingly demanding that WordPerfect open up the proprietary Office architecture.

"Now the database structure is very proprietary: I can't run the reports that I need to off the message information" database, said Gary Wilkerson, supervisor of end-user services at Kaiser Foundation Health Plan of Georgia, Inc. in Atlanta.

Sink or swim

An open client/server communications platform and a clear strategy are vital to WordPerfect's chances for survival in the corporate messaging market, users and analysts agreed.

The company's long-term strategy — as in late 1995 — is to provide a common interface for users to look at three different database formats currently supported by WordPerfect's InForms forms packages, the recently purchased Soft Solutions document indexing software and Office. The company plans to publicly discuss this development in April, officials said.

Users said they particularly want Office's client software to work on other vendors' back-end services and Office's message database to be made accessible for use in application development.

"The goal is [to] open up the back end in a modular fashion," said Eldon Greenwood, product marketing director for Office.

Full MAPI support is planned for Office 5.0, which will be renamed before its client/server version is delivered in early 1995. Previously, the company indicated only that MAPI support would allow MAPI clients to run the WordPerfect messaging services, not vice versa.

MAPI is Microsoft's messaging subsystem that provides a logical layer between Windows and Windows NT desktop software and server-based services. A limited version of MAPI is

available now but requires Microsoft Mail to operate. A fuller version, which will be independent of Microsoft Mail, will ship with Chicago (Windows 4.0). For its part, Microsoft plans to port MAPI to other platforms with the help of partners, according to sources close to the company.

First on WordPerfect's agenda are plans to ship support for the limited MAPI and the Ven-

Toward a perfect office

THE MAY/JUNE RELEASE OF WORDPERFECT OFFICE 4.1 WILL INCLUDE THE FOLLOWING:

- ▶ An updated Novell MHS gateway that adds directory synchronization between Office and MHS, plus a similar one for Banyan System, Inc.'s StreetTalk directory
- ▶ Support for the "simple" MAPI and the Vendor Independent Messaging interface
- ▶ Support for Apple Computer, Inc.'s Applescript and Apple Open Cooperative Environment interface to Apple's System 7 messaging subsystem
- ▶ A telephone access server option that allows users to process E-mail and calendar messages by phone
- ▶ Gateways and servers that run as Novell NetWare Loadable Modules or will run on OS/2 or Unix
- ▶ A fax/print gateway for receiving faxes

дор-Independent Messaging (VIM) interface in WordPerfect Office 4.1, which will ship in late May or early June. That should allow Office applications to share information with Microsoft Mail and Lotus Development Corp.'s CC:Mail.

Also, Version 4.1 will have the ability to exchange information with Novell, Inc. and Banyan Systems, Inc. directory services through upgrade gateways (see box).

In addition to new modularity, WordPerfect Office 5.0 will open up Office's message store database so that developers can access the information in mail-enabled and Simple Network Management Protocol (SNMP) network management applications, Greenwood said.

However, WordPerfect does not plan to open Office to use other vendors' message storing databases, such as Hewlett-Packard Co.'s OpenMail. Such a move would kill the calendaring, task management and status tracking functions, he said.

To plug and play, or not

Dividing Office into plug-and-play front- and back-end services is "an iffy proposition. That opens them up to the possibility that people will buy what they like — the desktop applications — and snap in other transports," said Patricia Seybold, president of Patricia Seybold Group in Boston. "But if they don't do it, they'll lose market share among major accounts."

Additionally, the company is working with messaging vendor Isocor to develop native X.400 transports and X.500 directory synchronization. However, those features are unlikely to be native to Office by Version 5.0, Greenwood noted.

What users can expect in Version 5.0 is the ability to configure the client software so that it never directly accesses the message store and directory databases. Instead, the client makes a request, the server fulfills it, and the client displays the response. This scenario, Greenwood said, increases security by closing off client access to the server database and could improve client-level performance by shifting the bulk of processing to the server.

Halfway there

Since an Office interim release in October, users have been able to opt for a "partial client/server option" in which the client can read the message database but cannot write to it, shifting much of the processing to the server.



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News Shorts

Clinton export plan criticized

The Clinton administration disappointed the industry last week with its plan for liberalizing the export of high-performance computers and telecommunications equipment. The administration boosted the definition of supercomputers by almost a factor of eight. The supercomputers are barred for export to unfriendly countries, and in draft legislation, the administration proposed a 90-day cap on the time the government may take to act on export license applications. The American Electronics Association said the proposals "fall far short of reform" because they would not end unilateral U.S. controls that harm U.S. industry without aiding national security. Others said the 90-day limit was actually a retreat from the current 30-day review period.

Executives shuffle at Sun

Sun Microsystems, Inc. reshuffled its top executives last week, finally naming a president for the company's hardware business and broadening the software responsibilities of SunSoft, Inc. President Ed Zander to include Sun Technology Enterprises. Sun Chief Executive Officer Scott McNealy, who vacated the presidency of Sun Microsystems Computer Corp. nearly nine months ago, chose as his successor J. Phillip Samper. Samper is a former vice chairman of Eastman Kodak Co. and a member of Sun's board of directors.

Hub and router vendors mix it up

Wellfleet Communications, Inc. and Alantec Corp. will jointly develop an interoperable networking platform consisting of Wellfleet's backbone multiprotocol routers and Alantec's PowerHub family. The goal is to provide seamless interconnectivity between mixed LAN and wide-area networks, Wellfleet said, while ensuring interoperability between the two vendors' products.

HP aims subnotebooks at corporate use

In a tactical shift, Hewlett-Packard released a new version of its OmniBook subnotebook, its first effort to target corporate users. The 2.9-pound OmniBook 430 differs from the consumer-oriented OmniBook 425 by eliminating applications in ROM, enabling users to choose their own software. It also boosts the hard drive size from 40M to 105M bytes. The 430 ranges in price from \$1,199 to \$1,599, significantly less than the OmniBook 425, which dropped in price by some 18%, to a base price of \$1,795.

Press rifles Tonya's E-mail box

U.S. Olympic skater Tonya Harding's electronic mail may have been read by journalists covering the games in Lillehammer, Norway, according to a report in the *San Jose Mercury News* last week. The newspaper said one of its reporters saw another journalist use a four-digit code to break into Harding's E-mail account last week. The code has become "an open secret" among reporters at the games, the report said. The Olympic Committee has warned all athletes and Harding's coach.

SHORT TAKES Market research firm Dataquest, Inc. said 1,000 information systems managers budgeted an average of \$7 million on client/server computing in 1993. Some 52% of the money went toward infrastructure costs, while 29% was spent on software. . . . Cray Research, Inc. has spun out a new company called Computational Engineering International, Inc. in Research Triangle Park, N.C., to sell and support En-Sight, an engineering software package.

More news shorts, page 16

Chip first to support 100VG-AnyLAN

Silicon expected to speed product delivery

By Stephen P. Klett Jr.

A chip set recently unveiled by AT&T Microelectronics has moved another form of 100M bit/sec. networking technology one step closer to users' desktops.

Due to ship to select partners in April, the Regatta 100 chip set from AT&T Microelectronics is the first silicon to support the 100VG-AnyLAN protocol from Hewlett-Packard Co., AT&T and IBM.

100VG-AnyLAN provides a data rate of 100M bit/sec. over four pairs of Category 3, 4 or 5 unshielded twisted-pair cable. It also supports the network design rules and topologies of 10Base-T Ethernet and Token Ring networks.

The Regatta chip set consists of a twisted-pair transceiver chip, an integrated media access controller and Extended Industry Standard Architecture/Industry Standard Architecture system interface chip and a repeater chip.

The chip set incorporates 100VG's "demand priority" media-access control scheme, which was designed to transmit data packets containing time-dependent traffic ahead of less-critical packets.

Geared for video

According to many observers, this makes 100VG a superior alternative to 100Base-X—a 100Mbit/sec. Ethernet standard being pushed by Grand Junction Networks, Inc.—for running applications such as multimedia. 100Base-X preserves Ethernet's traditional media-access method, which report-

edly means users will not need to be retrained to implement it [CW, Jan. 11, 1993]. However, 100Base-X does not support Token Ring.

Analysts said the chip set was vital for 100VG in light of the competing Fiber Distributed Data Interface, 100M bit/sec. Ethernet and

year's end, according to Bob Roth, manager of campus networking systems at IBM. IBM is pushing 100VG-AnyLAN as the means for Token Ring sites to migrate their networks to 100M bit/sec. speeds.

However, Roth said IBM may soon announce support for Grand Junction's 100M bit/sec. Ethernet protocol as well. "There is no one technology out there, like socks, that one size fits all," Roth said.

Welcoming but wary

Users said they were encouraged by 100VG's progress but remained cautious in their plans to implement 100M bit/sec. technology.

"I like the HP [AnyLAN] approach because it preserves our investment in cabling, but we haven't yet decided which path we will choose," said John Scoggin, supervisor of network operations at Delmarva Power & Light Co. in Newark, Del.

In addition, some users said workarounds such as bridging and switching provide enough relief that they do not see a dire need for 100M bit/sec. speeds today.

"Right now we can alleviate any bottlenecks we encounter in our LAN through segmentation via hubs," said Nancy Long, network manager for Montgomery County in Dayton, Ohio. "However, we may need to move to imaging shortly, which will require 100M bit/sec. speeds to the desktop," she added.

Other vendors reportedly working on hardware based on the Regatta chip set include Digital Equipment Corp., Kalpana, Inc., Ungerman-Bass, Inc. and Standard Microsystems Corp.

On the move

Evolution of the 100VG-AnyLAN protocol

November 1992

100Base-VG proposed to IEEE.

September 1993

HP and IBM announce plans to add Token Ring support. Name changed to 100VG-AnyLAN.

January 1994

IEEE 802.12 accepts draft specifications with Token Ring additions.

February 1994

AT&T announces Regatta 100 chip set.

April 1994

Draft standard due.

Asynchronous Transfer Mode products that are coming out.

"The chip set is important because it moves 100VG from [vaporware] status to realware," said Kathryn Korostoff, president of Sage Networks Research, Inc. in Natick, Mass.

For example, IBM and HP are jointly developing concentrators and adapter cards that will ship by

Dell strategy pitches custom notebooks

By Michael Fitzgerald

AUSTIN, TEXAS

Dell Computer Corp. jumped back into the notebook market last week and will try to win back customers with its custom configuration capabilities.

Dell will use the build-to-order business model that has been successful in the mail-order market to custom-configure its notebooks with any combination of software or hardware a user chooses from an extensive Dell catalog, said John Medica, Dell's vice president of portable products.

Dell expects to offer the customized notebooks at prices comparable to less-customized products from vendors such as Compaq Computer Corp. and IBM.

Specific product plans include the following:

- Immediate availability of the Latitude, a slightly enhanced and re-

marketed version of AST Research, Inc.'s Bravo notebook. The sub-6-pound product includes a 33-MHz 486SL enhanced processor, PCMCIA drives, an integrated trackball and up to six hours of battery life. Starting price: \$1,699.

- A more feature-rich premium notebook designed by Dell for delivery early in the second half of the year. A subnotebook will follow. Sources said Sony Corp. will make the subnotebook, though Dell would not confirm this.

- Differentiation via bundling. For instance, the Latitude comes with CommCentral, which includes Traveling Software, Inc.'s Commworks integrated communications package; Radio Mail Corp.'s Radio Mail, a two-way wireless messaging service; and access software for America Online.

"Custom configuration is their

differentiator," said Janet Cole, an analyst at Dataquest, Inc.

All forgiven?

The bigger question is whether corporate customers will look at Dell again after its six-month absence from the market.

"We're glad they're back in the market because we were worried about continued support and upgrades" for Dell notebooks, said Scott Lee, PC support manager at Blount, Inc.'s Blount Construction subsidiary in Montgomery, Ala. Lee cited Dell's ability to do custom configurations as a major reason Blount buys from the company.

Analysts said Dell does not have to be a technology leader to get back into the notebook market.

"If they can execute, people will buy from them," said Bruce Stephen, an analyst at International Data Corp. in Framingham, Mass.

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Mainframes

CONTINUED FROM PAGE 1

question, acknowledged Linda Hubbard, manager of IBM's software business strategy, at the Share users group winter meeting here last week. "We've still got more challenges in front of us."

"Frankly, we don't want to see a big change in revenue," added Gary Ferdi-

nand, director of System/390 coupled systems for IBM. Ferdinand noted that the company has "been wrestling with this for two years," although he said he expects the matter to be resolved in the near future.

IBM's pricing of its CMOS-based parallel transaction and query systems is sure to be watched closely by mainframe users wondering if the System/390 architec-

ture can compete on cost against other platforms, such as Unix machines and the AS/400 midrange line.

John Chapman, the Amoco Corp. senior technology consultant who is president of Share, said the parallel transaction engine could be useful for splitting large CICS installations into more manageable units. That would be less disruptive than making a wholesale

change to a distributed computing setup, "but we don't know what the price points are yet," Chapman said.

James Cassell, an analyst at Gartner Group, Inc. in Stamford, Conn., said software pricing is "the biggest problem" facing IBM as it rolls out the parallel technology. "No doubt they can make a competitive hardware platform" because of the CMOS processors, Cassell said. "Software cost is the issue."

"They've got to break the mainframe curves, and they don't know how to do that gracefully," added Carl Greiner, an analyst at Meta Group, Inc. in Westport, Conn. Greiner said he expects IBM to try a bundled pricing approach to buy more time to work out the software issue.

Can it compete?

CMOS-based parallel technology "sounds interesting, but it will depend on the cost and whether it's competitive with other platforms," noted Laurel Barker, data processing manager for Salt Lake County in Utah.

"I think IBM has a major struggle with pricing, but obviously if they don't address that they're going to keep eroding business to nonmainframe platforms, most of which don't have [IBM's] name on them," said a user from a large financial services company who asked not to be identified.

The software pricing conundrum applies mainly to the parallel transaction system, which will run the same version of MVS as traditional mainframes, Ferdinand said. The DB2 query machine uses only a subset of MVS, so its pricing does not have to compare directly to the traditional ES/9000 hardware.

IBM is trying to structure the pricing so customers would pay the same capacity-based license fees for a single-image mainframe and a parallel system with similar performance, even if the parallel machine were made up of multiple smaller engines coupled together, Ferdinand said. Under the existing nonlinear software pricing, it is more expensive to buy multiple small systems.

For example, a customer wanting to combine four of the upcoming 50-MIPS CMOS processing engines into a 200-MIPS parallel system must pay for a separate MVS license for each 50-MIPS processor — which would cost more than a single one for a 200-MIPS machine, Ferdinand noted. IBM is looking to help the customer around that price gap by basing license fees on the aggregate performance of the 200-MIPS machine.

However, doing so without changing the traditional mainframe pricing structure would allow the parallel customer to pay less for a 50-MIPS MVS license than what another customer would pay for a standard 50-MIPS mainframe. That flies in the face of IBM's practice of pricing MVS, DB2, CICS and other software products according to processor group.



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IBM pins RS/6000 makeover hopes on PowerPC

By Jean S. Bozman

IBM is counting on its PowerPC chip to transform its 4-year-old IBM RS/6000 line from end to end, starting with the unveiling this week in Boston of a PowerPC-based Unix portable that becomes the new low-end RS/6000.

The new IBM Portable workstation, built by Tadpole Technologies, Inc. in Austin, Texas, will use the PowerPC 601 and Tadpole's Nomadic Computing Environment software interface, according to sources close to IBM. It will also include PCMCIA slots, built-in Integrated Services Digital Network capabilities and removable hard drives.

For users, the coming changes in the RS/6000 line mean that low-end Unix portables and workstations will be available at PC prices, while high-end symmetrical multiprocessing (SMP) Unix servers will host multigigabyte relational databases for commercial downsizing applications.

The RS/6000 makeover will continue this summer with the introduction of SMP servers [CW, Feb. 7] and then continue through the year as laptop Unix PCs (see story page 41) and technical workstations are shipped.

"IBM and Unix have always been a unique mix because I think they went kicking and screaming," said Mark Korinek, a research engineer at the Mayo Clinic's Biomedical Imaging Resource

laboratory in Rochester, Minn. IBM needs to be more aggressive about price/performance to win out over its Unix rivals in the workstation market, he said. "We'll support the fastest horse, and right now HP, Sun and SGI are competing faster and better," he added.

IBM showed off some of its new PowerPC wares at last week's Share, Inc. user meeting in Anaheim, Calif. It also unveiled a coexistence strategy to position the RS/6000 as a complement to, rather than replacement for, AS/400s and ES/9000 mainframes running legacy applications. The first PowerPC unit, Model 250, was introduced last September.

IBM's marketing strategy has another twist. An RS/6000 can be used as a data lens to help client PCs and workstations navigate database servers and mainframes, said Dave Cassano, vice president of systems marketing at the RISC System/6000 division in Somers, N.Y.

Working together

Some users at Share said they want to use the RS/6000 and Unix to connect IBM's separate product lines.

"We're beyond asking for client/server," said Harold Hauck, Share's RISC System program director and president of Open Systems Computer Consulting in Santa Rosa, Calif. "I think it's accepted that client/server is here, and people are looking at what they need to make client/

serverwork."

To update its Unix products line, IBM divided development of its client RS/6000 systems from server development in January, Cassano noted. The organizational change aims to make IBM's low-end RISC workstations and high-end PCs competitively priced, he added.

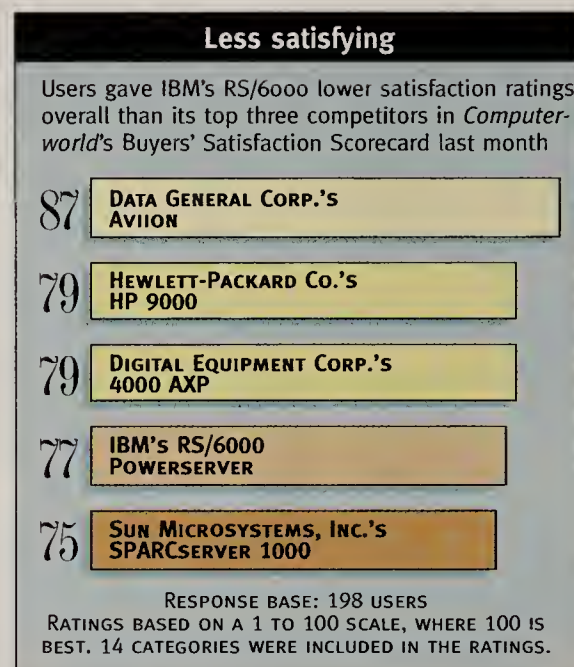
little late for some users, who said IBM missed its chance to have the Unix server of choice at user sites. Hewlett-Packard Co. made wide inroads by placing Unix servers at many IBM mainframe sites, and Sun Microsystems, Inc. remains the Unix workstation leader in high-volume sales, analysts said.

Yet some users said they think IBM has learned its lessons about open systems and is now willing to compete aggressively.

"They took the gloves off," said David Burrows, director of information systems technical services at FHP, a managed health care organization in Fountain Valley, Calif., near Los Angeles. His site is using distributed RS/6000s to off-load applications from an Amdahl Corp. mainframe and two minicomputers. "They're coming to the table saying, 'Here's a range of solutions, and here's what we can do for you.'"

If IBM steps up its Unix sales pitch, it will be careful not to undermine its AS/400s and mainframes.

"IBM has a very fine line to tread," said Thomas Kucharvy, president of Summit Strategies, Inc. in Boston. "They really are not in a position to say, 'The hell with minis and mainframes; we'll be a Unix vendor.'"



The division of labor will also allow more costly RS/6000 servers to be optimized for performance.

But the expansion of the RS/6000 at either end of the spectrum may come a

PowerPC gains some support

By Michael Fitzgerald and Ed Scannell

■ IBM is attempting to build momentum behind the PowerPC and hence bolster its challenge to Intel Corp. by garnering some big-name support.

In what may turn out to be a brick-by-brick approach to building its PowerPC alliance, IBM last week announced that Canon, Inc. will use the PowerPC chip in future systems. Also, sources close to the negotiations said Toshiba Corp. and Hitachi Ltd. are likely to do the same.

Believing good things start small, an IBM spokesman said IBM views Canon's participation as a "significant first step for PowerPC—it's the first major player to endorse the PowerPC platform."

IBM said Canon will support the PowerPC Reference Platform (Prep), a hardware system design pushed by IBM and Motorola, Inc. Some observers said they believe that if the PowerPC is to loosen Intel's iron grip on the microprocessor market, Prep will need a ringing endorsement from a wide variety of hardware suppliers.

However, Apple Computer, Inc., the other PowerPC partner, has so far kept Prep at arm's length, neither rejecting nor supporting the proposed hardware design. Instead, Apple's initial foray into the PowerPC, which began before Prep, will be based on a proprietary design.

A spokesman for IBM's Power Personal Systems division said Canon will cooperate on developing the Prep specification, currently headed toward a beta version. In the future,

Canon not only will build PowerPC systems but also may use the chip in high-end color scanners and other office products.

A Canon spokesman in Japan said the company had not established a product plan yet but had formed a subsidiary, Powerhouse, Inc., in Menlo Park, Calif. The spokesman said Powerhouse would be responsible for developing Canon's PowerPC products.

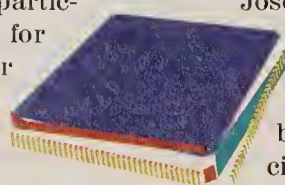
Unimpressed, most analysts downplayed Canon's impact.

"Canon is totally irrelevant—what [operating system] is this going to run?" asked Kimball Brown, an analyst at Dataquest, Inc. in San Jose, Calif. "What are they going to use? WorkPlace OS? That's absurd."

Some analysts disagreed, saying the ties with the three Japanese-based companies signal that the Pacific Rim is willing to concede the technology race in microprocessors to U.S.-based companies. This is important because the Japanese reportedly dislike Intel's control of the desktop standard.

If the Japanese fall in line behind the PowerPC, they may be less likely to develop an Intel alternative. NEC Corp. has already thrown its lot in with rival Mips Technologies, Inc.

"This commitment from the Japanese may be significant in that they are admitting they will not be contenders in creating the next-generation chip. From a global standpoint, it says the state-of-the-art microprocessor technology is still rooted here," said Frank Dzubeck, president of Communications Network Architects, Inc., a consulting firm in Washington.



Lotus and Sun join forces on Notes

By Lynda Radosevich

Highlighting the news that it is finally shipping a Unix version of its Notes software, Lotus Development Corp. went on the offensive last week, announcing a promotion with Sun Microsystems Computer Corp. and a series of planned Notes enhancements.

Sun will include free coupons for a Notes server software and five user licenses with its Sun SPARC servers until June 30. Lotus already expected to boost its current 750,000 Notes user base by 600,000 this year, and the Sun arrangement should help it move beyond that, said Jeff Papows, vice president of Lotus' Notes division. However, he did not venture to estimate how far beyond.

Lotus will address complaints about Notes' limited programming capabilities by adding functions similar to those found in Microsoft Corp.'s Visual Basic in Notes Version 4, which is due out next year, Papows added.

Meanwhile, delivery of Notes Version 3.1 has slipped by a month, to April, in order for multimedia support to be added, he said.

Also, Lotus has no plans to lower Notes pricing this year. Some analysts and users have said the company should lower Notes pricing to speed up a slow deployment rate. Papow would not discuss Lotus' plans to develop a lower-cost "Notes Lite" [CW, Feb. 21].

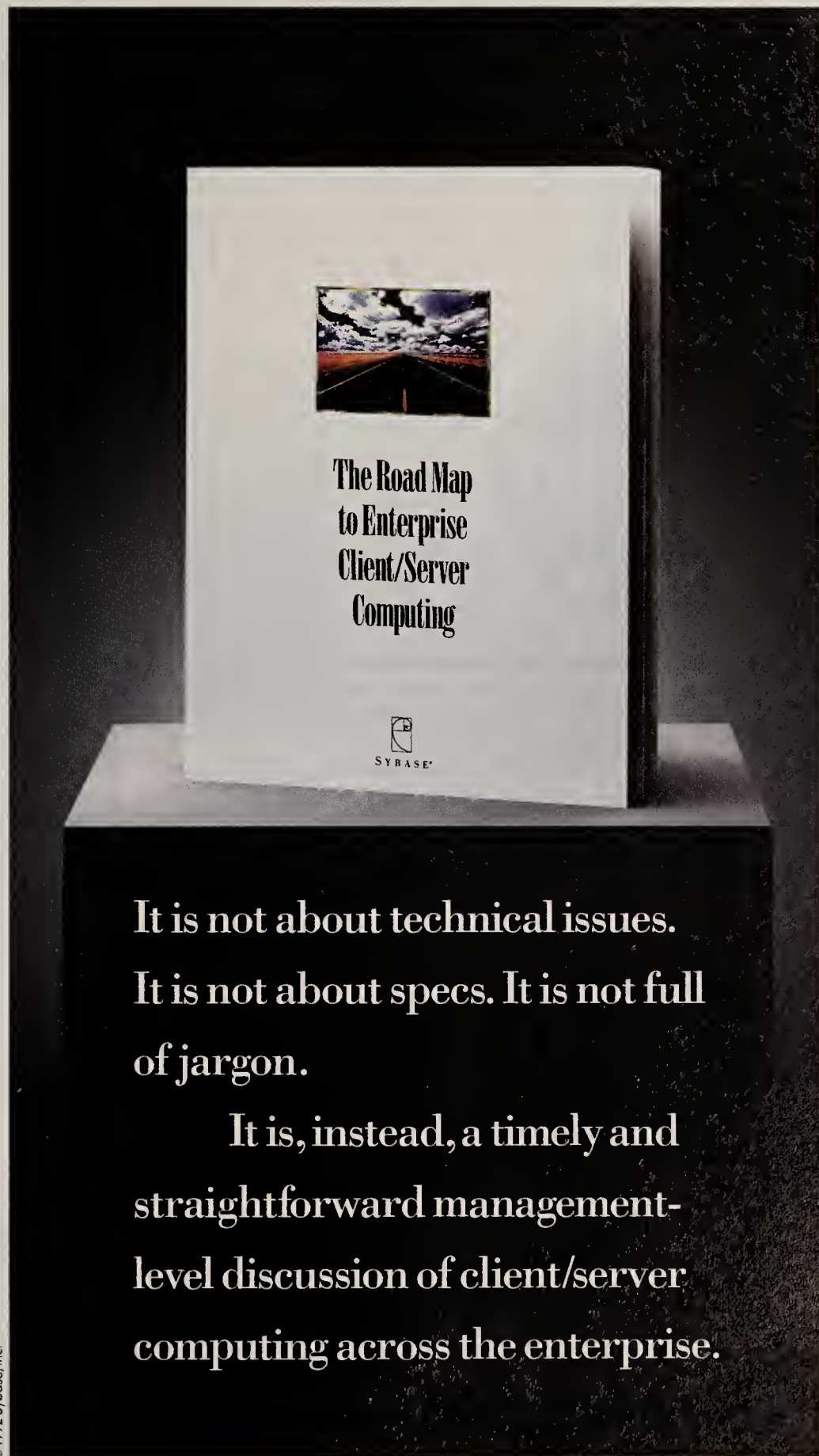
Targeting EMS

Lotus is positioning Notes against Microsoft's forthcoming Enterprise Messaging Server (EMS). Cliff Conneighton, director of marketing for Lotus Communications, noted that EMS is a messaging backbone using X.400 transport technology that is "nearly identical" to that of the forthcoming Lotus Communications Server. However, EMS is not a groupware platform, as is Notes, he said.

EMS' "shared folders don't do a whole lot to expand it beyond messaging," Conneighton said. "Notes is a client/server developer's environment... It has its own tools and extended platforms and is aimed at a class of applications that goes well beyond mail."

New E-mail LAN servers still not robust. See story page 65.

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Windows 4.0

Microsoft bets big on beta test of Chicago

By Stuart J. Johnston and Ed Scannell
SAN FRANCISCO

Users who were impressed by Microsoft Corp.'s 65,000-copy beta test of its Windows NT server operating system haven't seen anything yet.

When Chicago, or Windows 4.0, the next major update to Microsoft's desktop version of Windows, goes into widespread beta testing this summer, it will be distributed to literally "hundreds of thousands" of users, a company official said last week.

Such an order would constitute the largest beta program ever in the industry.

Some developers said they believe the motive behind Microsoft's beta blast is to catch up on a schedule that has slipped to the point where the company may have difficulty meeting its promised year-end delivery.

"I think most know Microsoft now has a compressed development cycle with Chicago," said one applications developer. "So the natural thing to do is to increase the breadth of the beta so that more people get to test a wider variety of applications quicker." Using this beta release is like going from Windows 2.0 to 3.0 with the addition of task-switching and protected-mode memory, not Windows 3.0 to 3.1, he said.

Another reason for the large beta pool, according to some developers, is that Microsoft is doing some technical "trial ballooning" of certain features.

Developers said they think most trial ballooning will focus on the product's new object-oriented interface,

which is intended to make Windows easier for novice computer users to learn. Microsoft needs an extremely large beta program to gauge the reaction of millions of Windows users to a dramatic change in the look of its product.

"This is an enormous testing project to get the feedback they need on this new interface because no two people work alike. But they have to shake out other things like the device drivers and how they work with applications, and then [there's] all the new Win32 stuff they have to jump up and down on," said another developer, who requested anonymity.

Yet another reason for the large beta test is to drown out any noise that rival IBM intends to make later this year when it delivers OS/2 2.2 to beta testers.

Microsoft asserts that the prerelease copies of NT were not technically betas but rather software developer's kits that contained "prerelease" versions of NT code.

"We went to 10,000 [betas] for Windows 3.1," which has sold more than 40 million copies, "so we're going to have to go out to hundreds of thousands of users" to test Chicago, said Paul Maritz, senior vice president of Microsoft systems.

The current beta schedule, presented to developers at a conference in December and made public here last week, calls for a limited beta test of "several hundred" users to begin by the end of March. A more widespread beta will begin this spring, most likely in May or June, and will expand to include hundreds of thousands of users as the beta tests progress.



What's hot in plug and play

Microsoft last week demonstrated a pre-beta version of its Chicago (Windows 4.0) operating system, which features the most complete plug-and-play support yet, and officials reiterated their intention to include full plug-and-play support in Chicago when it ships.

Among the new capabilities shown last week was the ability to perform so-called "hot undocking," in which a user removes a laptop computer from a docking station without rebooting the machine.

Microsoft showed "hot docking" — plugging a laptop running Chicago into a docking station without rebooting — at Comdex/Fall '93 in Las Vegas. Hot undocking is more difficult, however, because the system has to gracefully recognize that it is no longer connected to resources such as disks and networks, said Paul Maritz, senior vice president of Microsoft systems.

For example, in last week's undocking demo, a dialog box warned the user that the laptop was about to be disconnected from the docking station and asked whether the user wanted to proceed.

Other demos showed how Chicago running on a nonplug-and-play-enabled PC was able to configure a plug-and-play CD-ROM drive without any changes to the underlying hardware.

The first time a user installs a plug-and-play device in a plug-and-play PC, Chicago will ask the user to choose to install it using either a default plug-and-play device driver that comes with Chicago or the one that came with the third-party device.

After that, when the user inserts the device — say, a network connection — Chicago will merely beep to let the user know the capability has been activated. — Stuart J. Johnston

IBM PC Co.

CONTINUED FROM PAGE 1

delivers, they might start buying from it again.

"IBM has been making progress in certain areas, such as quality and support, and we are looking at them again," said John Woods, PC systems specialist at Chevron Information Technology Co. in San Ramon, Calif.

Increasing the resemblance

One of IBM's immediate goals is to bring the PS/2 and ValuePoint lines closer together on the component and technology side.

How close is not clear, but officials stressed that they will maintain both the PS/2's Micro Channel Architecture (MCA) and ValuePoint's XT/AT bus architecture. In fact, they also plan to add the Peripheral Component Interconnect bus to their product line.

"How it all gets implemented we're not sure, and in the next few months we have to resolve that," said Stuart F. Cohen, PC Co.'s director of commercial desktop brands. Cohen said resolution would come as the company looks at "the whole commercial desktop space to see what

we can do to meet customer needs."

Users said they would like to see a variety of features added to the PS/2, including integrated SCSI-2, on-board network adapters and more MCA add-in cards. Others said they want to see more MCA-like configurability brought to the ValuePoint line.

"We're getting to the point where we can say to the customer, 'What specifications do you want?' so we can change it," Cohen said.

However, the IBM officials said that rather than wholesale change, users will most likely "see the ValuePoint [line] have some premium attributes over time. And you will also see the premium line take on some of the attributes of the ValuePoint line," Santelli said.

Standard fix

The lack of standard components has caused delays in shipping PS/2s and is a major motivation for bringing industry standard components into the PS/2 line. IBM also wants to gain better economies of scale, Cohen said.

Analysts also lauded a more unified

strategy for IBM's marketing efforts.

"The basic business box is more and more a ValuePoint or a ProLinea-type box, so having a separate, high-end 'corporate' line makes less and less sense," said Bruce Stephen, an analyst at International Data Corp. in Framingham, Mass.

For the present, IBM plans to respond to reports of the MCA's demise by making a massive push for it.

more transparent ways for users to work with it.

Holmes said IBM's "total lack of support for the Micro Channel Architecture has been extremely disconcerting." He said he would welcome IBM's boosting that.

Caught by promises

IBM officials say their dilemma with the PS/2 line lies with its 9 million installed machines: The company has promised corporate accounts it will not change the PS/2 radically. This has slowed IBM's ability to advance the architecture and get new products out.

Cohen also gave a timetable for fixing the lengthy delays in PS/2 Model 76 and 77 delivery: The old PS/2 Models 76 and 77 will be available

in volume in late March. That cheered users who were stuck when IBM pulled a new version of the machines off the assembly lines.

"That's the best news I've heard all day," said Don P. Babcock Jr., manager of client services at Cajun Electric Power Cooperative, Inc. in Baton Rouge, La.

Floundering flagship

IBM's PC technology leadership kicks in at the middle of its line and lags at the high end (PS/2)

	Processor	Hard drive	Bus	Price
PS/2	486DX2, 66 MHz	540M bytes	MCA	\$3,386**
ValuePoint	Pentium, 60 MHz	424M bytes	PCI local bus	\$4,149**
Ambra	DP60 PCI Pentium	340M bytes	PCI/AT bus	\$2,439*
PS/1	486DX2, 66 MHz	253M bytes	Local bus video	\$1,900***

*Suggested retail price

**IBM PC direct price

***Street price (without monitor)

Source: International Data Corp. PC Pricing Service, Framingham, Mass.

"The thing I have to do right now is get Micro Channel on a fast track. Micro Channel is going to get an afterburner," Santelli said.

PC Co. executives said they want to stress that MCA has been a plug-and-play architecture since its introduction in 1987 and that they will soon announce

Shamrock

CONTINUED FROM PAGE 1

George P. Wakefield, senior manufacturing engineer at GM North American Truck Platforms in Troy, Mich., summed up the optimistic but cautious reaction of many observers.

"Finally, some players are getting together, collaborating and trying to grab market share," he said. "At this point, it's still a hope and a prayer."

Even so, several analysts said the Shamrock effort was an important first step toward a standardized document management model analogous to what SQL did for database products.

"People are finally starting to realize that documents — this unstructured data — is a valuable corporate asset that needs to be captured and managed," said Heidi Dix, an analyst at the Software Strategies service of Forrester Research, Inc. in Cambridge, Mass.

Large companies, Dix said, have tended to deploy departmental-level document management approaches but now need some method for providing enterprise access to this data.

That is the case at pharmaceutical giant Merck & Co., a Shamrock Advisory Council member.

The development of industry APIs for document management "will let [Merck] mix and match technologies much more

easily than today," said Charles Popper, vice president of corporate computer resources at Merck.

Popper said Merck had delineated four requirements for its document management architecture: multiserver scalability and support for heterogeneous clients; a "compelling" user interface; support for complex (linked and compound) documents; and a document management architecture that is part of the overall corporate information tech-

nology architecture.

Analysts said the presence of large users in Shamrock — Aetna Life & Casualty Co. and The Coca-Cola Co. are also members — was an encouraging sign.

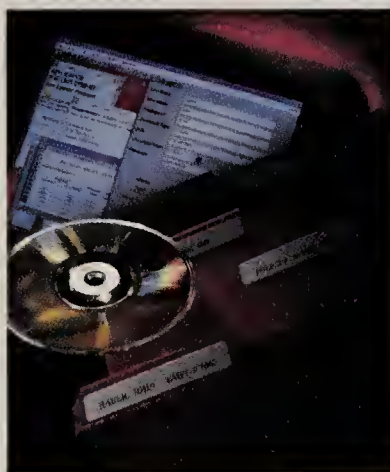
"I think if several [other] big users join up saying, 'We really need this,' it'll happen," said Mark E. Walter Jr., a consultant at Seybold Consulting Group in Media, Pa.

Other users interviewed on the show floor said they welcome the concept and

confirmed that one of the thorniest issues they face is a lack of enterprisewide tools for managing and accessing documents that have different formats and come from different sources.

"I think you need a generalized API, like [Adobe Systems, Inc.'s] PostScript, and I think [Shamrock is] a good direction," said Lou Melendez, western regional marketing manager at R. R. Donnelley/Database Technology Services in Willowbrook, Ill.

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First look

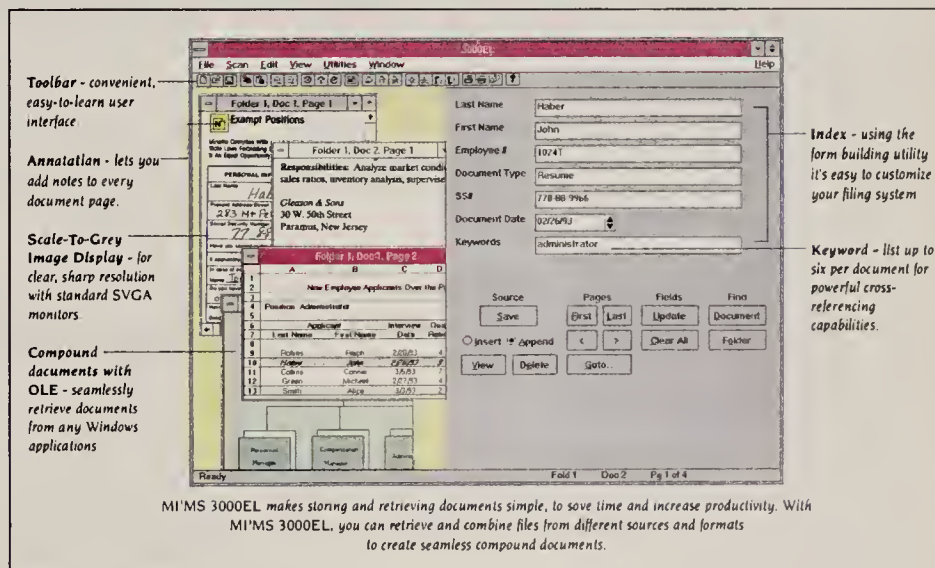
Mezzanine, an electronic librarian, may be the first manifestation of what products conforming to the Shamrock API will be able to accomplish.

First developed by Saros Corp. in Bellevue, Wash., Mezzanine is actually a document management engine that manages the administration, security and audit trail of files stored on one or more servers. Saros APIs will be the basis for Shamrock.

The companion Saros Document Manager product provides a graphical file manager that allows users to perform keyword searches across large numbers of documents in a variety of formats. It includes a number of viewers and facilities to route documents by E-mail, print them or see their attributes. The entire package is priced at \$495 per workstation.

"The pendulum has swung back," said Brian Cassidy, vice president of business development at Saros. He argued that the LAN-connected desktop PC is no longer a "private utensil," and that the 30 years' worth of know-how about centralized data management that grew up around mainframes is now sought by users of client/server computing. — *Ellis Booker*

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News Shorts

Compaq wins first round in injury case

Compaq Computer Corp. has won the first jury verdict in a case alleging that a crippling wrist injury was caused by a computer keyboard. Compaq successfully argued in a Houston court that its keyboard was not to blame for legal secretary Patsy Heard Woodcock's disability, and it suggested that stress and other factors could be involved. The verdict demonstrates that keyboard injury cases are hard to prove, but eventually "one will go in the other direction," predicted Robert Dieterich, managing editor of "VDT News," a newsletter in New York.

Antimonitoring bill passes

The U.S. House of Representatives' subcommittee on labor management relations last week passed a worker privacy bill that restricts employers' use of electronic monitoring techniques. The broadly worded bill would also curtail business monitoring of electronic mail and other computer networks, said William Moroney, executive director at the Electronic Messaging Association in Arlington, Va. He called H.R. 1900 "a ludicrous bill."

California signs on WordPerfect

WordPerfect Corp. said last week that it signed the state of California, including all city, county and district governments, to its Customer Advantage Program discount licensing program. A state spokesman said the program should help reduce California's WordPerfect expenditures by 50% and will save an estimated \$4 million per year.

AT&T adds faster cellular technology

AT&T said it would modify its Autoplex System 1000 wireless communications infrastructure to accommodate Personal Communications Services. It said last week it would add Time Division Multiple Access, a new form of cellular communications that works at much greater speeds than current cellular communications. AT&T said, however, that it would not be broadly available until mid-1995.

DCE application tool kit debuts

Gradient Technologies, Inc., a developer in Marlboro, Mass., announced Visual-DCE last week. Visual-DCE, an application development toolkit for Microsoft Corp.'s Visual Basic tools, helps developers write Windows-compliant applications for the Open Software Foundation's Distributed Computing Environment (DCE). The tool kit is priced at \$495 and is shipping now.

IBM to add 'predictive' disk caching

IBM's storage systems division plans this week to introduce a new caching technology with built-in predictive intelligence for its high-end 3990 Model 6 disk storage products, sources said. The Record Cache feature uses learning-based algorithms to predict what data users will need from the disk, a capability that IBM said should speed up the performance of many applications, the sources said. Also scheduled to be released is a remote copying feature for backing up data, according to the sources.

SHORT TAKES Ernst & Young, the New York-based consulting firm, is looking for successful technology entrepreneurs for its Entrepreneur of the Year awards. . . . Aldus Corp. last week said it has signed a letter of intent to acquire Compumation, Inc., a vendor of network-based print and image management systems. Terms will be disclosed when the deal is completed, Aldus said.

Obex access easier with kit

By Melinda-Carol Ballou

Borland International, Inc. will this week make available to a wider audience the data distribution capabilities of its Object Exchange (Obex) middleware technology via a new Obex Enabling Kit.

Obex provides the means for distributing data across different applications, messaging systems, platforms and network protocols, Borland officials said. The technology has previously been available only as an embedded utility within Borland packages, such as Paradox and Quattro Pro.

"Obex [lets us] immediately access different kinds of communications services" such as Vendor-Independent Messaging and Messaging Application Programming Interface (MAPI), "staying within an object-oriented architec-

ture," said Ted Marr, president of Portfolio Technologies, Inc., a developer of workflow software in Newark, Calif.

"If it works as advertised, [Obex Enabler] would let us create applications that collaborate more easily and more cleanly in terms of messaging support," said David Sherr, a first vice president at Lehman Brothers, Inc., a New York investment company. "Currently, you have to know who you're sending messages to. Using Obex, that's one step removed."

"One of the things we're planning on using it for is to distribute departmental applications across

our mail transport systems," said Bill Vannerson, supervisor of user services at Blue Cross & Blue Shield Association, a health insurance company based in Chicago.



Lehman Brothers'
David Sherr says
Obex Enabling may
provide key support

The Obex Enabling Kit includes utility tools, sample programs, templates and manuals to let developers incorporate Obex into their applications without building extensions or creating low-level MAPIs. Applications can access Obex services

through Dynamic Data Exchange or direct API calls.

Obex is available now through Borland's Developer Relations Early Experience program.

Oracle

CONTINUED FROM PAGE 1

stands, Office 2.0 does not fulfill Oracle's ambition of enterprise-level groupware, said Larry Stevens, vice president of enterprise multimedia at Oracle.

Further, Oracle may be overly optimistic in asserting that it can overturn more entrenched office and E-mail products such as WordPerfect Corp.'s Office (see story page 6), observers said.

Oracle executives, including Chief Executive Officer Larry Ellison, have billed Office and its future iterations as "far beyond" Notes functionality [CW, Sept. 6, 1993].

Adding document management capabilities — already part of Notes — to Office will move Oracle a big step closer to its groupware goal. Such a feature would let users wield desktop tools such as E-mail to manipulate text and images — as well as traditional data types — stored in the Oracle 7 relational database. Document management support is due out late this year, Stevens said.

Mixing and matching

"We want to take some of the good ideas of Notes and put them on a more stable, relational footing," Stevens said. Users' major beef with Notes is its inability to access data stored in relational databases, such as Oracle. Without a connection to relational data, Notes' potential is limited to small, departmental mail-based applications, said Kevin Kraft, project manager at Chicago consultancy Grant Thornton Co.

Lotus is working on a relational link, but Oracle aims to add Notes-style document management functions before Lotus ships the link.

Meanwhile, Oracle's ace, according to Stevens, is the ability of the underlying Oracle 7 database to support thousands of users enterprisewide. It is stronger than a simple Notes database, which was designed for small groups of close-knit workers.

However, still without a hint of a ship date is support for the Vendor-Independent Messaging (VIM) and Messaging Application Programming Interface (MAPI) messaging standards. This support, Stevens said, is "essential" for any office automation product. Applications that support the standards let desktop users send or receive E-mail while using word processing or other applications. Oracle is committed to VIM and MAPI, Stevens said, but he declined to specify when Office 2.0 or other Oracle products might actually support them.

Notes itself is missing some of these features, not the least of which is VIM and MAPI support. Also troublesome is Oracle's reluctance to commit to a time frame for porting Office to Microsoft Corp.'s Windows NT operating system.

"When you're thinking client/server and groupware, you want to plan for the future. A choice of operating systems, including NT, goes into that thinking," Kraft said.

"The jury hasn't returned a verdict yet on whether NT will be a factor in groupware," countered Brinton Baker, senior director of product marketing for Oracle desktop products. "We'd have to see a lot more than 100,000 copies of NT getting out there."

Office 2.0 does include impressive directory service capabilities to smooth E-mail exchange across larger sites, noted Carl Mousley, lead clinical systems analyst at Centocor, Inc. in Malvern, Pa. For example, Office 2.0 can figure out the log-on of an E-mail recipient if the message sender does not know his colleague's exact system name. Office 2.0 also supports X.400, Unix Mail and Message Handling Service gateways.

However, Centocor already runs WordPerfect's Office "quite extensively" and therefore is not likely to jump to Oracle's product, Mousley said.

"I liked what I saw. . . but it would be an uphill battle to convince [corporate IS] that this product might be better than WordPerfect, which we've all been using a good long time," Mousley said.

Workflow software moves beyond imaging. See page 97.

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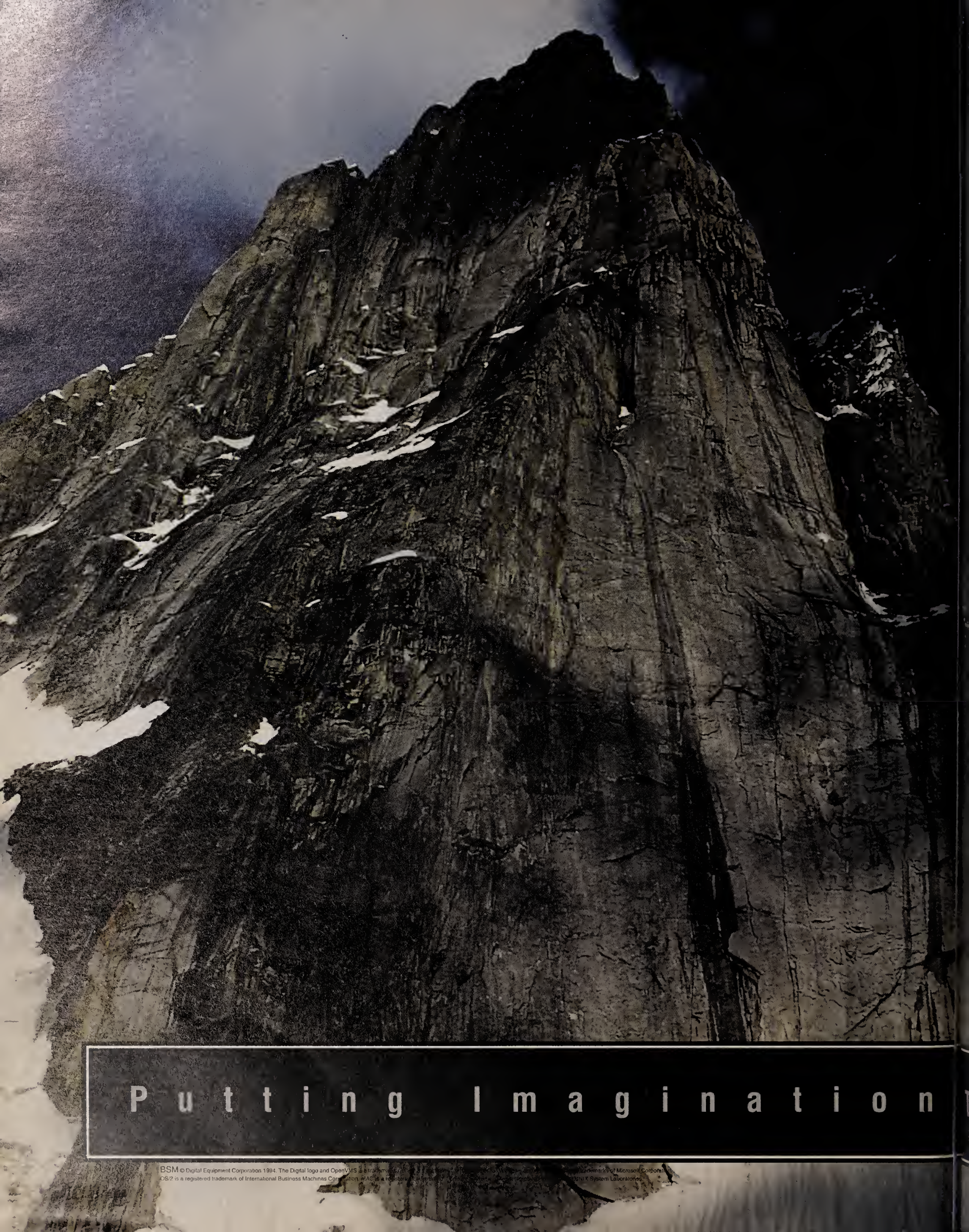
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Tools offering could ease design process

By Melinda-Carol Ballou

Users seeking to ease the process of enterprisewide development may find some relief this week from Intersolv, Inc. and IntelliCorp, Inc. at Software World/USA in San Francisco.

Intersolv is offering configuration management with links to additional

third parties, while IntelliCorp is providing an object-oriented tool for building object-oriented applications.

Such tools are needed today due to rapidly changing markets in which developers cannot afford a long, drawn-out design process. "You need to be able to respond quickly," said Dave Booty, project leader at Paradigm Management,

Inc., a Dallas-based systems integrator that beta-tested the IntelliCorp tool.

Industry analysts and corporate developers said the ability to manage software changes across teams of client/server developers has been a major hassle.

Intersolv, which already supports links to approximately 20 other tools, is

expected to announce agreements that will link its polytron version control system (PVCS) software to a range of development tools. These include Microsoft Corp.'s Visual Basic, Gupta Corp.'s SQLWindows, KnowledgeWare, Inc.'s ObjectView and Easel Corp.'s Enfin.

PVCS spans operating systems and platforms to enable groups of developers to handle software configuration management. Under the agreements, for example, Visual Basic will ship with an interface to Intersolv's PVCS.

This will help developers that may start off using Visual Basic as a prototyping tool but find that once the project grows in complexity, the product cannot scale up because it was not designed to be a client/server linchpin, said Judith Hurwitz, president of Hurwitz Consulting, a Watertown, Mass., consultancy.

As a result, Microsoft is looking to third parties to handle version control across groups of programmers, she added.

For its part, IntelliCorp has announced Object Management Workbench (OMW), an object-oriented analysis and design tool focused on business modeling and rapid development.

OMW generates C code enabling developers to create object-oriented applications without necessarily having to learn C++ or Smalltalk, said Steve McClure, manager of object technologies at International Data Corp., a Framingham, Mass., consulting firm.

OMW models are active and executable at all stages of the development process and support incremental modifications.

"When you make a change, instead of having to go through long compile cycles, you can throw [the change] in there and run it," Booty said.

Key for Booty's group was the integration between OMW and IntelliCorp's Kappa development environment, which he said enabled them to generate code immediately from the object models created with OMW.

OMW is priced at \$10,995 and is shipping now. A combined product offering that includes Kappa and OMW with a graphical user interface builder, data access and runtimes for Unix and Windows is priced at \$25,995. An analysis and design-only version of OMW costs \$6,000.

Carmaker takes client/server road. See page 81. **Wal-Mart** picks Progress tools for greater flexibility. See page 81.

Key features

IntelliCorp's Kappa tool includes the following:

- A graphical, interactive development environment.
- Object and application browsers.
- ProTalk 4GL, combining procedural languages with object-oriented fourth-generation languages that support rule-based processing, pattern-matching and querying.
- Quick, incremental development of executable prototypes.

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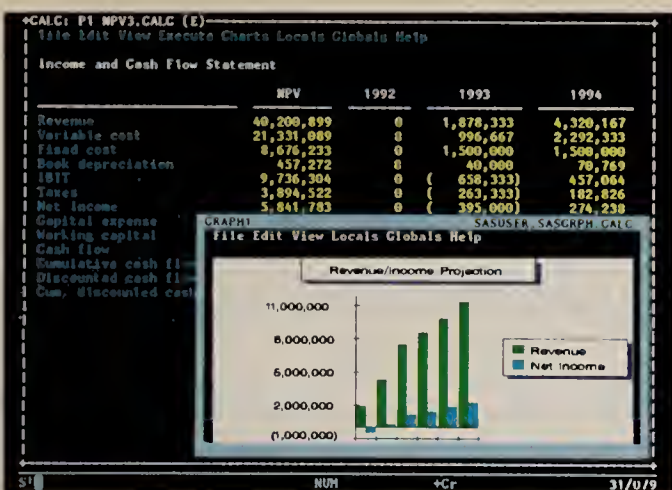
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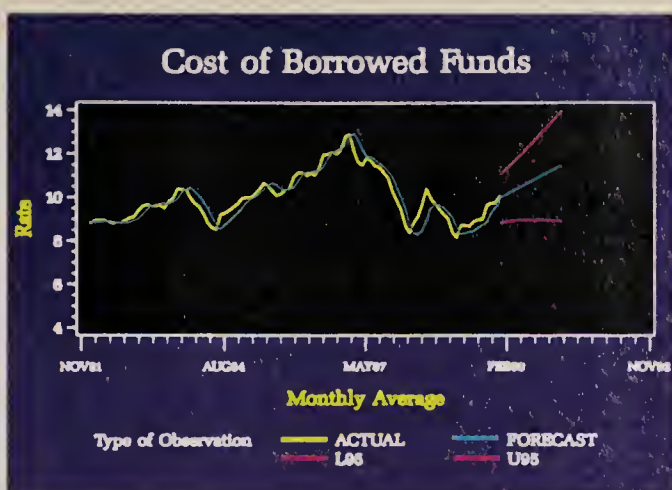
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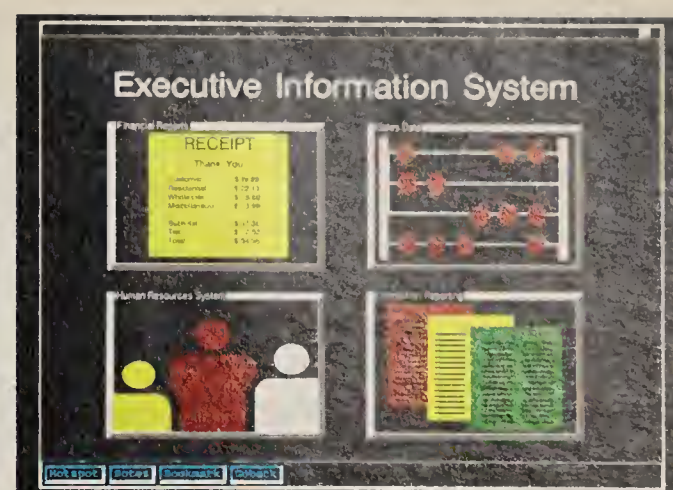
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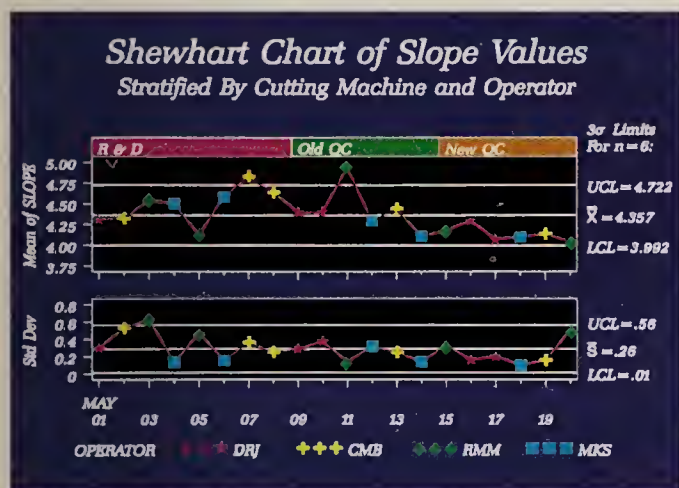
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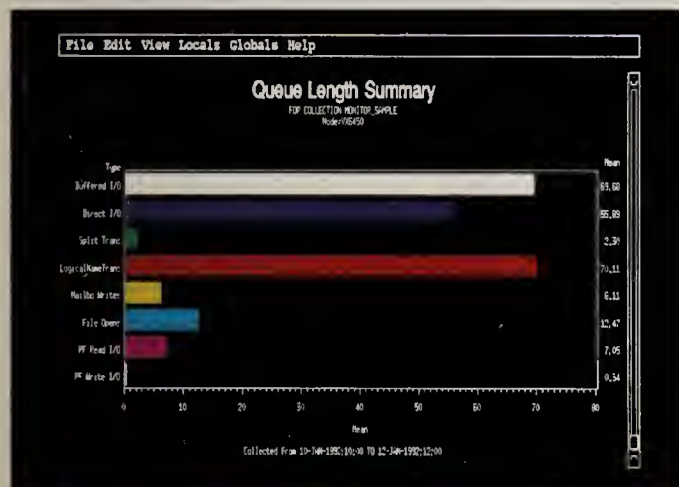
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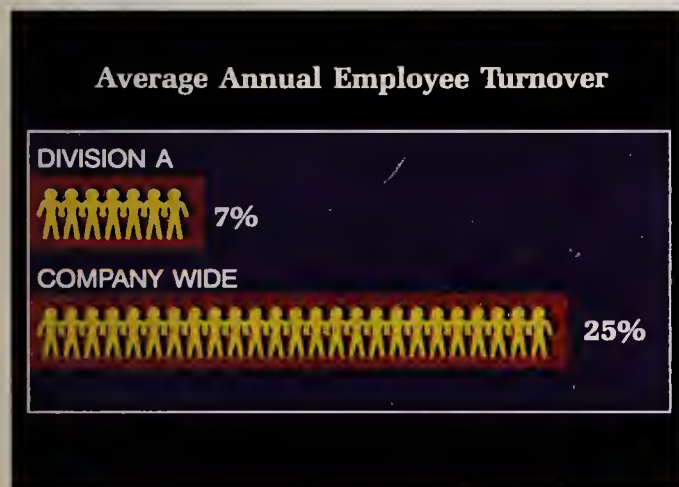
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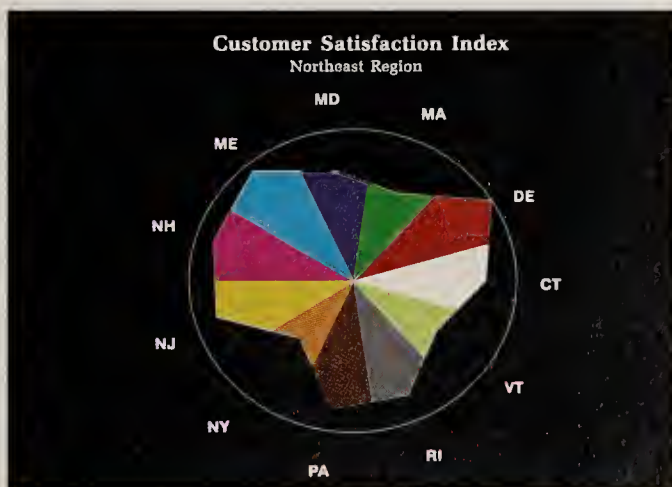
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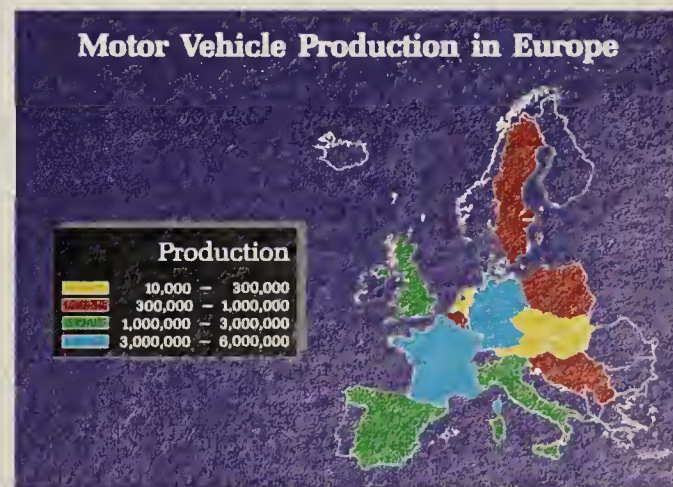
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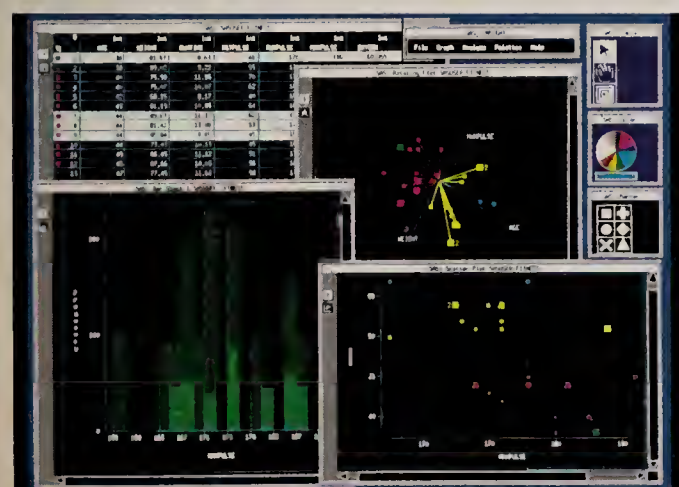
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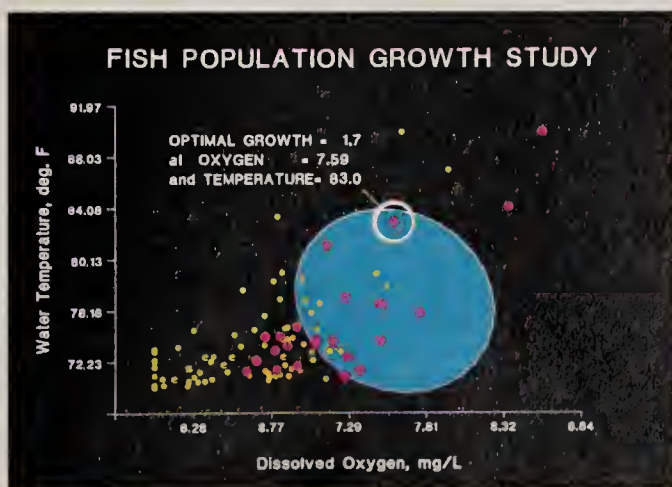
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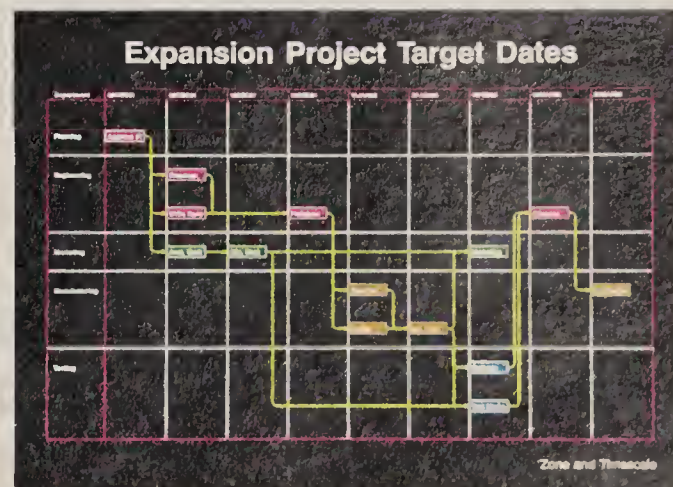
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Smart cards lose out in health reform

By Mitch Betts
WASHINGTON

When the health care reform train left the station, the smart card industry was left behind. Now, it is trying to hop aboard to avoid losing what may be its best chance for widespread success in the U.S. market.

Despite an initial flirtation with smart cards — plastic cards with an embedded memory chip — the Clinton administration's health care reform task force opted for cheaper, magnetic-stripe cards for patient identification.

In response, the Smart Card Industry Association, based in Alexandria, Va., has begun a campaign to see if it can re-

verse that decision before the Clinton proposal moves through Congress this year.

The fledgling, 50-member task force has also begun a letter-writing campaign, said Janet Sayles-



Smart cards pose price and privacy issues

Falls, executive director at the association.

"When the Smart Card Industry Association started back in 1989, the technology was looking for an application," Sayles-Falls said.

"Now, it has a killer application with health care reform."

The association argues that smart cards will provide more privacy for medical records and enable patients to take their medical records to any medical facility they visit.

Cost a big factor

However, the industry has to overcome some serious objections that caused the Clinton administration to back away. The biggest hurdle may be cost: Smart-card readers and the cards themselves are more expensive than magnetic-stripe technology.

John S. Silva, who cochaired the information systems panel for Clinton's task force, said he could hardly recommend spending billions of dollars on a smart-card infrastructure at a time when the president is trying to keep costs down and get fast implementation.

Similarly, the Workgroup for Electronic Data Interchange, a public/private task force on streamlining health care administration, recommends magnetic-stripe technology because of the cost and low market penetration of smart cards.

Industry sources said that if smart cards were produced in the millions, their cost would come down to \$3 or \$4 apiece, compared with 35 cents for magnetic-stripe cards. But Sayles-Falls said the costs have already come down considerably, to the point where countries such as France and Germany can afford to deploy smart cards for health care.

The second biggest issue is whether smart cards really offer more privacy. Privacy advocates worry that smart cards could become national identity cards, with a complete medical history. The Clinton administration responded to this concern by opting for magnetic-stripe cards that carry only patient identification and administrative data — not full medical records. Those will be stored in computer databases.

According to Sayles-Falls, it is a misconception that full medical records would be stored on the smart card. Instead, just insurance data and key data elements for emergency medical care would be on the card [CW, Dec. 6, 1993].

Moreover, the association argues that smart cards can be partitioned so clerks can see administrative data but not sensitive medical data.

A third objection is more prosaic: What happens when Aunt Martha loses her smart card or forgets to bring it to the doctor's office? Smart card advocates said the records would be backed up on computers so that would not be a big problem.

RemoteWare,

and the
CONVERSION

OF JARED FARRELL.

A skeptic
FROM WAY BACK,

Jared Farrell the
Salesman had out-
lived more than

one attempt at automating field communications. The near-daily software updates. Nightly communication sessions that didn't. Inventory that wasn't. Prospects that...weren't.

So the fact that something called RemoteWare® had been implemented to automate sales processes for farflung laptop jockeys like himself had held little charm for Farrell. A client/server system built with software tools already happily in use in hundreds of large companies worldwide, with automated dial-up communications for transporting centrally-created electronic forms, documents and reports between home office legacy systems and even the most remote PCs? Terrific. Plus routing and query facilities to make sales-critical information simple to get and easy to use... on the road. Excuse me?

But within just days of the fading hook shot that sent the CIO's announcement memo into Farrell's round file, he was using the new applications electronically dispensed by RemoteWare. Entering daily orders, filing expenses, and penning a humble note of thanks to the CIO, from 30,000 feet. All quietly and automatically delivered by RemoteWare while he slept. A fitting complement to the inimitable selling routine of one Jared Farrell. Indeed.

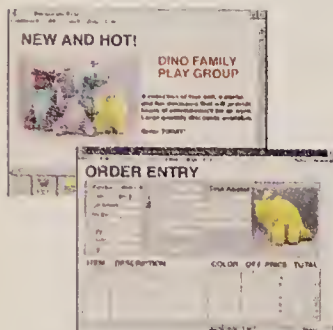
Now, as he slid into the Central Office Staff Room six months later and five minutes

late, Farrell watched the eyes of the room swivel towards him, like half a volley at Wimbledon. And the CIO and VP

of Sales were headed his way with...a plaque?

"Jared Farrell, Salesperson of the Year," it read.

Salesperson of the Year. Imagine that.



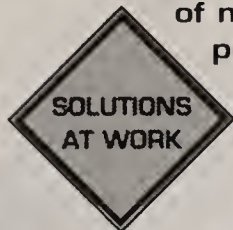
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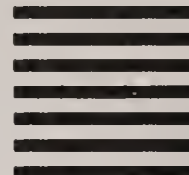


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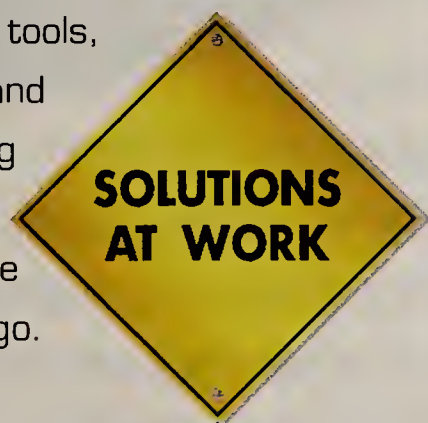
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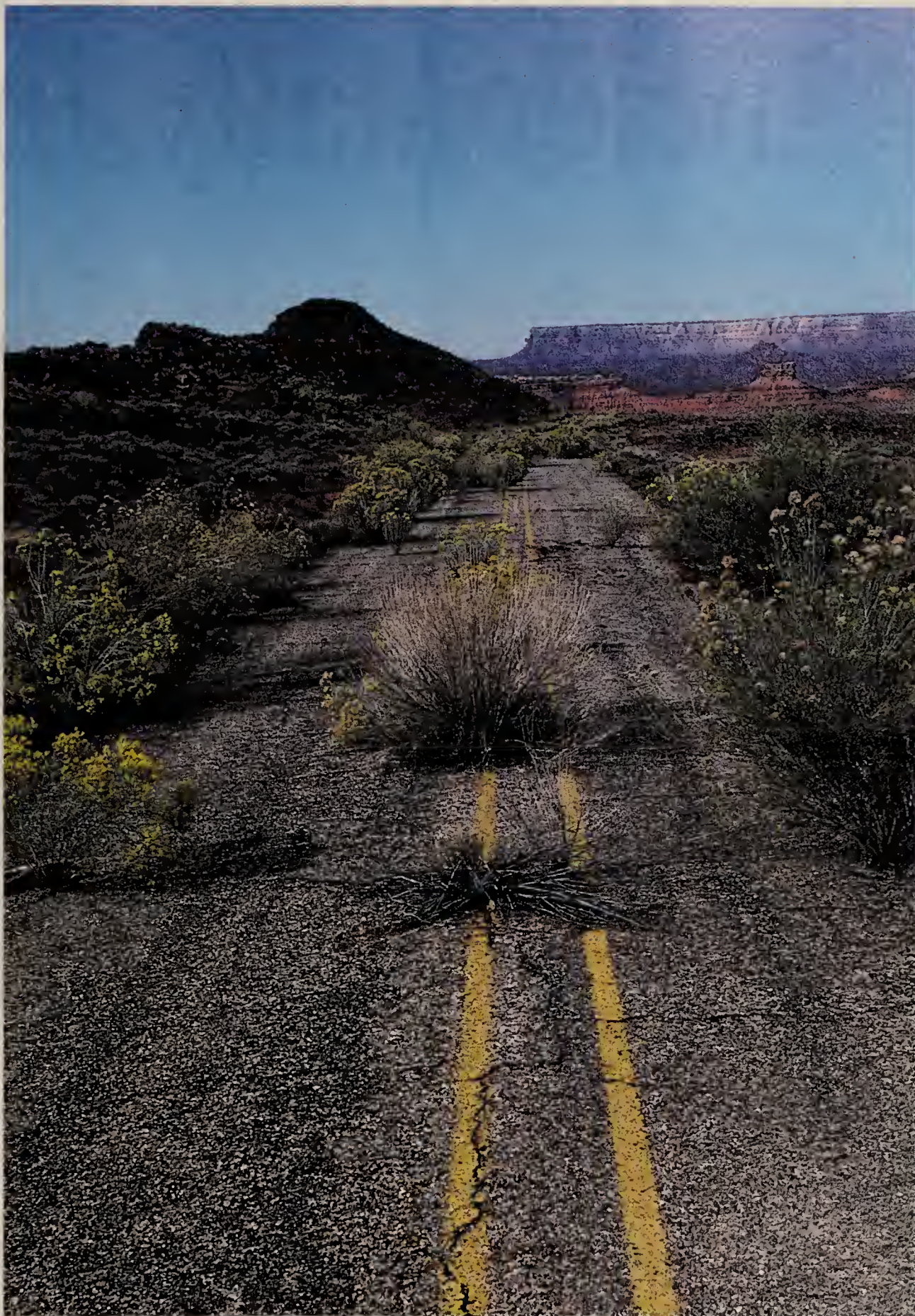
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The whole is always great Incidentally, in networki

■ As confusing as it sounds, there truly are two completely opposing ways to look at high-performance networking. One is the big picture, the sum total of your network. Because it's

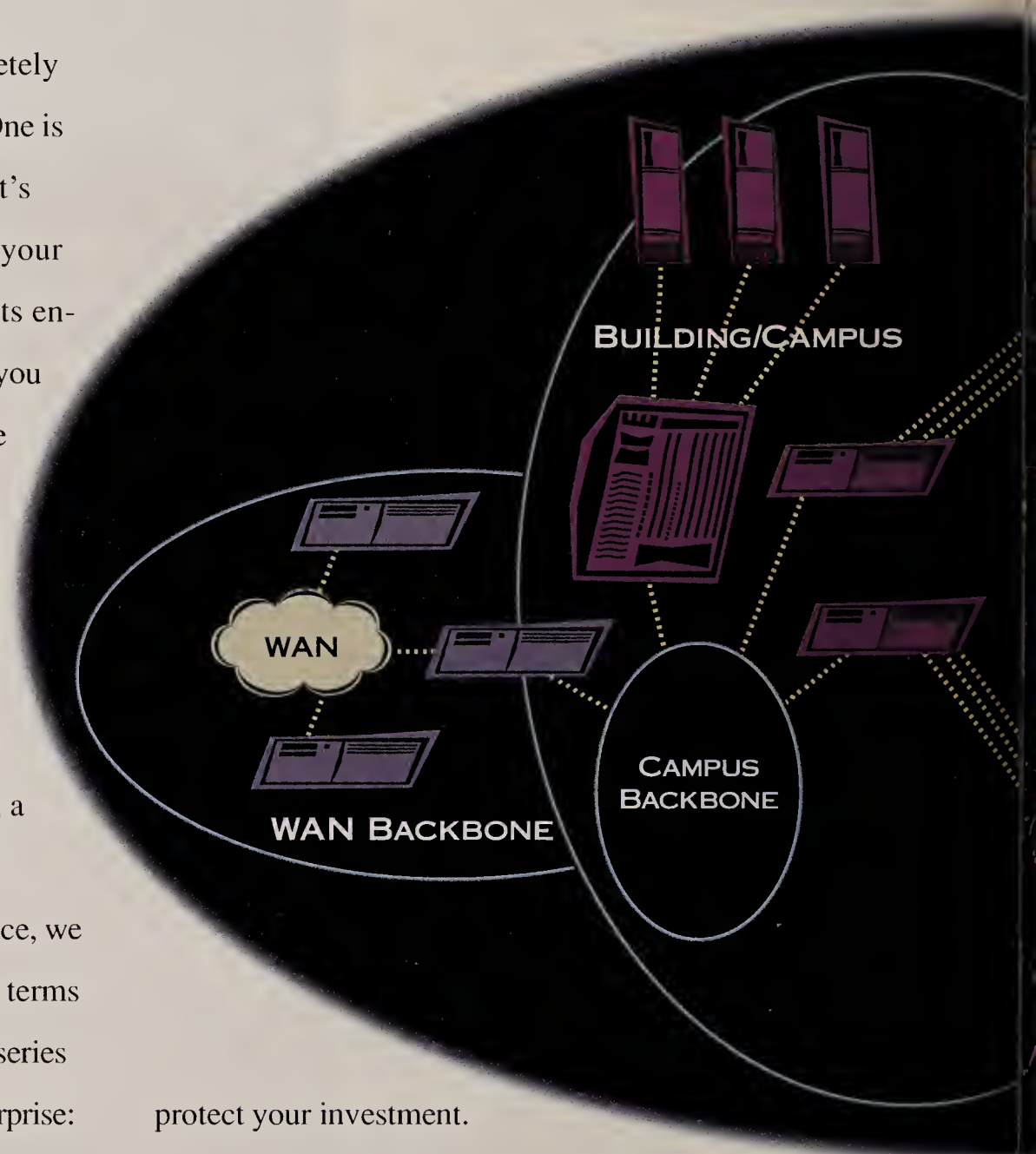


only by viewing your network in its entirety that you can be sure it's carrying your organization

toward the future without compromising the investments you're making today. Conversely, you can't afford to overlook the smallest detail either. After all, unless it responds and even anticipates the needs of the individuals using it, a network has failed to live up to its potential.

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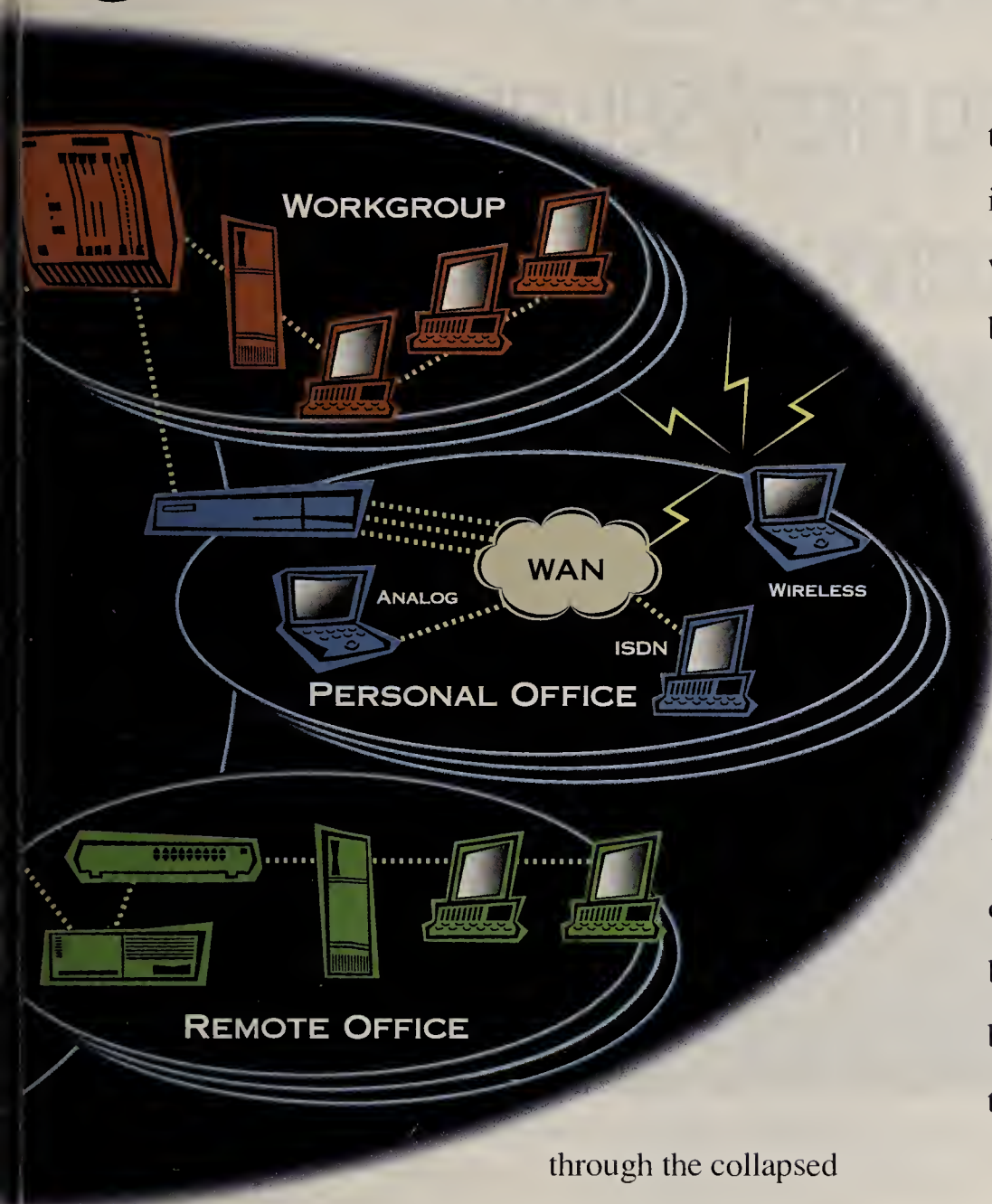


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At the heart of this high-performance network is the "collapsed backbone." It concentrates the LAN backbone connections into a single bridge/router, simplifies the wiring complexity between floors, and centralizes your network's management to help you reduce costs while greatly simplifying administration and support.

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er than the sum of its parts. ng the reverse is also true.



through the collapsed backbone. And all complexity is centralized, where administrative costs are substantially lower.

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Again, complexity is reduced while at the same time performance actually increases.

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Info highway paved with gold for top IS talent

By James Daly

The information superhighway: great futuristic fantasy or warmed-over political rhetoric? Either way, experts say it will not get built without backbreaking work from information systems managers, and the scramble is on to beg, borrow or steal to get top talent.

"After all the smoke clears from the front pages, people will realize that the only way they can make money on this thing is by being technically competent and putting complicated strategies to work," said Mike Roberts, vice president of networking at Educom, an organization for colleges and universities in Washington.

Money to be made

Large publishing houses such as The Times-Mirror Co., which stand to make a fortune if their vast array of books and newspapers can reach an electronic marketplace, have already begun poaching. A month ago the Los Angeles company snared Michael Liebhold, a top Apple Computer, Inc. scientist who specialized in broadband network technologies and interactive media; he was named vice president of technology.

A week later Times-Mirror grabbed Sun Microsystems, Inc.'s director of systems architecture, Thanos Triant, and named him vice president of IS.

Denver-based US West is also salivating over the potential of the information superhighway; it recently appointed two key executives to construct a 14-state multimedia network. Don Warkentin, who joined from Mercury One-2-One in the UK, and Larry Levine, formerly of Arthur D. Little, will manage the expansion and pay particular attention to business uses of the system.

Analysts said the national information infrastructure that Vice President Al Gore talks about is just a metaphor to create new products, services and markets. A vast web of interlinked networks could be used to build products faster through collaborative design, allow suppliers and customers to work more closely and keep employers in touch with a far-flung work force.

IS managers who want to ensure their marketability

in such an interconnected environment must be proficient on many platforms and in many areas, observers said. "Lotus Notes, groupware, electronic data interchange, the Internet, internal mail — they're all a microcosm of what we're going to experience on the information superhighway," said Robert Blanning, a professor at the Owen Graduate School of Management at Vanderbilt University in Nashville.

The push to employ interlinked PCs to gain competitive advantage during the past few years has already pushed many in the right direction. But that is just the beginning — the number of LAN connections on corporate networks is expected to increase by 80% this year to more than 60 million, according to the Dataquest, Inc. research house.

As users increasingly work together, they will link their wide-area networks, leading some to predict the emergence of a GAN, or global-area network.

"The lessons being [learned] during this expansion should be heeded in the superhighway design," Blanning said. Among them: navigating multiple platforms and getting distributed users acquainted with working together in a virtual community.

Of the people, for the people

To turn the networks into a "national information infrastructure," as Gore hopes, the nets must extend beyond large offices and into homes and small businesses by becoming cheaper and easier to use.

That is not going to be easy. The Internet, for example, illustrates one of the practical problems facing the data superhighway. "We can't let the potential of the system be stymied by its complexity," said J. Daniel Couger, a Distinguished Professor of IS at the University of Colorado in Colorado Springs.

It will become the responsibility of the software developers to make the information-retrieval process easier. They will also be called on to create intelligent agents that search through tens of thousands of available databases to find the answers to questions.

In-demand IS personnel will also need to be clever at problem solving. Remote diagnostics will be key — as network usage increases, so will the vulnerability to breakdown.

Superhighway credentials

Observers said the following skills will be needed to pave the information superhighway:

- ▶ **Multipatform experience** — specifically, the ability to handle technology from many providers.
- ▶ **Willingness to change.** It may be necessary to rethink the role of IS from one-way broadcast technology to two-way interactive environments.
- ▶ **Application development skills.** Creating intelligent agents that search tens of thousands of available databases to find the answers to your questions.
- ▶ **Security awareness.** As the number of users grows, expect attacks to become more frequent.
- ▶ **Simplifying network use.** Making the superhighway easy to navigate for nontechnical users.
- ▶ **Telecommuting.** Developing the management skills necessary to supervise a network of workers who may be spread throughout the region, state or country. — *James Daly*

"The toughest job any of us is going to have in this complex data networking environment is figuring out how to diagnose performance problems and anomalies that are almost inexplicable at the application level," said Internet pioneer Vinton Cerf, senior vice president for data architectures at MCI Communications Corp.

Network expansion will increase network vulnerability. In recent years, as the Internet has changed from the chat line of the academic and research communities to the party line of the computationally hip, attacks from outsiders have increased dramatically. What is needed are better authentication facilities, which means cryptographic techniques in the network.

Experts say there is other work to be done, especially in the areas of multipatform networking. "Don't let the hype scare you," Blanning said. "There really is something to the information highway concept. But we're not going to see it realized without a big kick from IS."

Senior correspondent Gary H. Anthes in Washington also contributed to this report.

Driver privacy on the way?

By Mitch Betts

WASHINGTON

■ **Congress is seriously considering privacy legislation to curb the sale of driver records by state motor vehicle agencies. But the bill is running into lots of opposing traffic, too.**

The legislation addresses the little-known fact that 34 states sell driver's records — name, address, height, weight, age, vision, Social Security number, type of car — to anyone for a small fee. Buyers include private investigators, who pay a few dollars for an individual "lookup," and direct marketers, who get complete magnetic tapes to build targeted mailing lists.

The driving force behind the bill is that stalkers can use the records to track down their victims, such as celebrities and estranged spouses. In Iowa, for example, teenagers recorded the license

plate numbers of expensive cars they saw, obtained the names and addresses of the owners and robbed their homes.

"Accessing government records is the most common way in which abusers and stalkers find their victims once they've moved in an attempt to escape," said David Beatty, spokesman for the National Victim Center in Arlington, Va.

The bill generally makes it a federal crime to disclose personal data from motor vehicle records but carves out exceptions for government bodies, insurance companies, automobile recalls and other business purposes. Marketers could get the bulk data if the state lets drivers "opt out" of commercial disclosures.

Pro and con

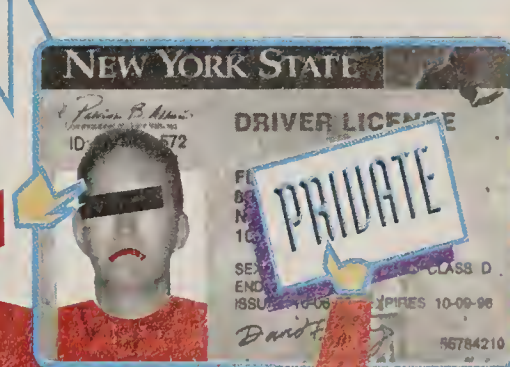
At hearings earlier this month, supporters included the Fraternal Order of Police as well as privacy and victims' rights advocates. But there is also a long list of opponents, including marketers, private

investigators and the news media, who fear their access to now-public records will be closed. Investigators argue they need the data to locate witnesses, missing persons and debtors.

The Direct Marketing Association said it is concerned that the opt-out provision will be such a costly administrative burden that states will stop selling data to commercial users.

But the state officials who would have to implement the legislation — represented by the American Association of Motor Vehicle Administrators — said they support it, as long as Congress will give them some money and a few years' time for implementation.

Mary J. Culnan, associate professor of business administration at Georgetown University in Washington, said state agencies with relational databases could easily tweak their records systems to



DAVID FLAHERTY

flag names of people who want more privacy. Other states would have to match their records to a list of "opt out" names.

The legislation passed the Senate last fall. Momentum for the bill built after actress Rebecca Schaeffer was gunned down in 1989 by a stalker who, through a private investigator, had obtained her home address from the California Department of Motor Vehicles.

Many views on the info highway. See page 35.

Briefs

Novell profits up

Novell, Inc. has reported net revenue of \$311 million for its first fiscal quarter ended Jan. 29 — up 20% from \$260 million for the same period a year ago. Net income was \$73 million, up 3% from \$71 million for the same period in fiscal 1993. Efforts to diversify the revenue stream through new products enabled Novell to reduce NetWare products to 66% of total revenue in the first quarter.

Spectrum loses

Spectrum Information Technologies, Inc., fresh from its much-publicized parting with former Apple Computer, Inc. Chief Executive Officer John Sculley, reported a loss of \$12.1 million for its third quarter ended Dec. 31, 1993. Spectrum showed earnings of \$387,000 for the same period last year. The loss included \$4.7 million to cover a class-action suit against the firm and \$2.9 million related to the shutdown of the firm's Data One subsidiary. Total revenue for the quarter was \$24.4 million, \$9 million more than the same period in 1992.

SHORT TAKES The ASK

Group, Inc. has elected Paul C. Ely Jr., 62, and Robert H. Waterman Jr., 56, chairman and vice chairman, respectively. The company also named Eric Carlson, 49, as president and CEO [CW, Feb. 21]. ... Wang Laboratories, Inc. new common stock is now trading on a regular basis on the NASDAQ. ... Dell Computer Corp. has appointed W. Scott O'Hare, 37, vice president for business development. He will help foment previously announced plans to re-engineer Dell's infrastructure. ... Cray Research Inc. has spun off an independent company, Computational Engineering International, Inc., which will seek to expand the market for Cray's MPPS engineering postprocessing technology into the workstation market.

EDS losing out on client/server

By Mark Halper

■ Publishing stalwart Meredith Corp. is driving its information technology shop in a client/server direction, but its mainframe outsourcer, Electronic Data Systems Corp., may miss much of the ride.

The Des Moines, Iowa-based publisher of *Ladies Home Journal* and *Better Homes and Garden* has discovered that client/server services are often available at more competitive rates outside of EDS. For that reason, and without naming EDS, Meredith Chief Information Officer Terry Marksberry said he is using his current outsourcer for some but not all of his client/server development.

Unfavorable client/server economics are also believed to have cost EDS its outsourcing job at Great Britain's Royal Automobile Club, which switched to client/server specialist SHL Systemhouse, Inc. to help it move from mainframe processing to distributed systems [CW, Feb. 14].

Making the greenbacks

The Royal Automobile Club and Meredith accounts spotlight the stark challenge confronting EDS in the client/server world today: not only how to implement distributed computing but also how to make money doing it.

"Client/server is a whole new market for outsourcers, and there will be just as many vendors who make money at it as who lose money," said Frank Casale, executive director at the Outsourcing Institute, a New York-based for-profit professional associa-

tion. Pricing client/server projects involves a lot of "trial and error because the unknown factors are more numerous than in any other type of arrangements," he said.

Client/server projects, according to users and analysts, require a new pricing paradigm based on service rather than processing, and neither EDS nor its traditional mainframe rivals have yet derived a reliable template.

"Client/server is a whole different kind of revenue and earnings model," said Merrill Lynch & Co. analyst Steve McClellan. "It's still fledgling, and it's hard to say how profitable it's going to be."

Pricing, profit, pursed mouth

If reticence is an indicator, then the issue is a sore one with EDS. Executives at the Plano, Texas-based outsourcer declined to be interviewed about their client/server pricing and profit challenges.

The company's concerns go beyond comprehending the nuances of project-by-project variations that can radically alter any deal's financial fabric.

EDS still carries a legion of employees steeped in mainframe ways such as Cobol programming. As customers demand more client/server attention, EDS will have to either retrain these employees or pay them to be idle, analysts said.

Still, EDS is regularly winning big iron jobs, and even client/server projects often include many years of mainframe processing while the user migrates. For example, late last year EDS won a 10-year commitment valued at about \$1.5 billion from the UK's Inland Revenue Service [CW, Nov. 29,

Fatal flaws

The deficiencies from the user perspective in the Meredith/EDS contract include the following:

- Imprudent contract negotiations.
- Vague definition of services included.
- Fixed price precludes future benefits.
- "Excessive" incremental costs, including client/server migration.
- EDS not legally required to amend contract.
- No escape clause.
- Inadequate provisions for adding providers.
- PC support costs tied to volumes instead of services.

SOURCE: MEREDITH CORP./INDUSTRY ANALYSTS

1993]. EDS is bidding on the Xerox Corp. job, expected to be decided within 60 days.

But the mainframe jobs at EDS have generally grown smaller. Revenue gain, which over the years has routinely registered in double digits and often more than 20% on the EDS books, weighed in at a light 4% in EDS' \$8.56 billion year ending Dec. 31.

Profit improvement was higher, as earnings rose 14%, to \$724 million, but analysts attributed that to avoid cost containment measures such as layoffs, hiring freezes and travel restrictions rather than to the fancy, on-the-job outsourcing economics that EDS will eventually have to develop in a client/server world.

EDS reduced its total head count by about 1,400 in 1993, to 69,686 employees.

Outsourcing personnel pays off. See page 74.

Communications industry

Bell/TCI merger killed over price

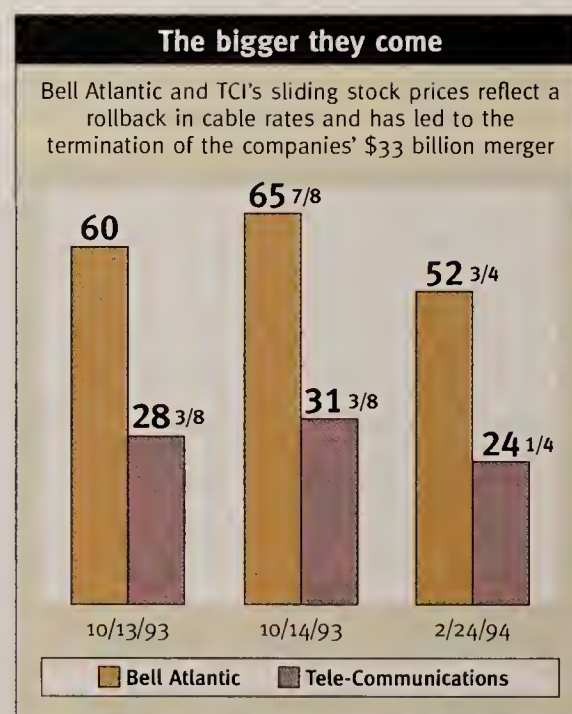
By Gary H. Anthes

Communications giants Bell Atlantic Corp. and Tele-Communications, Inc. (TCI) last week abandoned their protracted and troubled attempts to merge, saying they could not agree on a price.

The proposed merger, announced last October, was originally hailed as the granddaddy of a wave of communications industry linkups that would lead to the construction of the information superhighway, bringing broadband, interactive multimedia services to millions of homes, schools and businesses.

Regional telephone company Bell Atlantic said a decision last week by the Federal Communications Commission to force cable TV rates down by 7% had soured the deal — originally pegged at some \$33 billion — by reducing the value of TCI's cable operations.

But FCC Chairman Reed Hundt said in



a statement, "Tuesday's unanimous FCC decision did not in any way make the future of the cable industry more unsettled. Our adoption of a comprehensive set of regulations clarified the industry's future."

Regardless of the role played by the FCC, "this is no big deal for users," said Gary Arlen, president of research firm Arlen Communications, Inc. in Bethesda, Md. "Do you care who the contractor was who laid the pavement on Interstate 95? No. The information highway is going to get built whether by TCI money separately or TCI/Bell Atlantic money combined."

Analysts, meanwhile, said a steep drop in the value of Bell Atlantic stock — which was to have funded a large part of the acquisition — was a factor in the collapse of the deal, which would have been the largest in corporate history.

Arlen said the collapse of the megamerger may have a chilling effect on other proposed and rumored acquisitions in the communications industry. "I think we'll see a little pause now from the [merger] frenzy."

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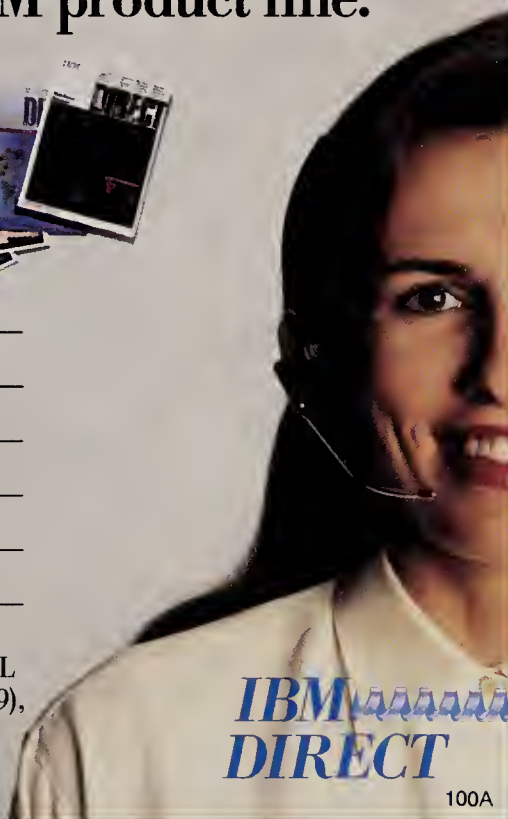
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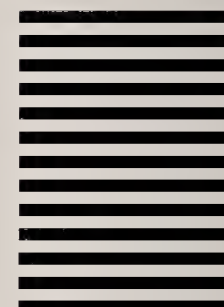
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Editorial

Science fiction

Last week's sudden collapse of the mega-merger between Bell Atlantic Corp. and Tele-Communications, Inc. shows how really difficult it's going to be to pave this information superhighway. Computer/television convergence is increasingly looking like fusion in a bottle — exciting to think about but just about impossible to pull off.

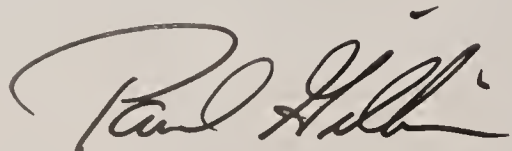
No industry is more prone to hyperbole than the computer industry, and convergence is the best example of how expectations have gotten wildly out of sync with reality. Computer people are infatuated with their visionaries. A mini industry develops around each vision of the future. Analysts produce reports showing exponential growth curves. Start-ups raise multiple millions of dollars on the promise of revolutionizing the home or the workplace. The media follows along because it all just sounds so neat.

The reality is that the technical infrastructure is still a long way behind the promise. Oracle staged a splashy rollout of its plans for video servers two weeks ago, but only a few test markets will have access to the services this year. Intel has drawn amazing attention to its ProShare desktop teleconferencing software even though the product requires ISDN, which has been the biggest financial black hole in networking since videotex. Spectrum Technologies lured John Sculley to the executive suite on the promise of ubiquitous wireless communication. One round of restated earnings, an SEC investigation and dramatically lowered expectations later, the bloom is pretty much off that rose.

When you consider that you still can't use a Touch-Tone phone from some ski areas in southern New Hampshire, the task of restructuring the country's communications infrastructure to support interactive television begins to look monumental. True, the technologies to deliver video to the desktop or the home are available, but it's at a price just about no one wants to pay.

And it's impossible to predict whether cable, copper, fiber or some combination of the three will be the dominant medium for these services. Then there's telephone deregulation bearing down on us like a freight train with the promise that the situation is only going to become more confusing.

IS managers are pretty skeptical about the whole convergence issue, and well they should be. This technology has all the characteristics of the videophones of the '60s and the personal jet cars we used to read about in *Popular Science*. Practical applications of interactive video will come when the technology is cheap and widely available. What we've got right now is mostly fusion in a bottle.



Paul Gillin, Editor



Letters to the editor

'C' for confusion

I read with amused interest Don Burleson's article, "C neophytes" [CW, Feb. 14].

A few weeks ago, a clerk was typing a stack of personnel forms one by one. Ninety percent of the information was in the company database just ripe for retrieval, so I decided to automate the process.

I pursued the project in C++, taking an object-oriented approach. Each type of form would be a derivative of class Form. I automated the form very quickly and trimmed away the excess until I had produced what I believed to be the most efficient code.

When I came back to the code a week later, what had made perfect sense a week before had suddenly become a monster. Although my code is rampant with comments, C and C++ are a breeding ground for confusing code. Because of the limited keyword vocabulary, heavy dependency on libraries and object-oriented concepts such as encapsulation and inheritance, I had written an "efficient" program that I couldn't even understand.

The problem is clear. Programmers today should really examine their finished projects and make readability a priority. High costs today run toward the redevelopment and maintenance of old software because the "efficient" code is undecipherable and wastes precious hours of labor.

C and C++ are not losing an ounce of popularity, and it doesn't seem like they will any time soon. Unfortunately, the lack of structure in both leaves the individual programmer to his own devices a bit too much. I believe we can af-

ford a picosecond here or there to keep maintenance costs down and other programmers sane.

Sgt. Fryderyk Sztajer
U.S. Army Reserve
St. Clair Shores, Mich.

The beauty of documentation

David Russell's Viewpoint column ["Just say no to documentation," CW, Jan. 17] reminds me of a comic strip I saw in *Mad* magazine some years ago.

Two children are watching television, where a symphony orchestra sits poised to play "The William Tell Overture." The narrator explains the origin of this beautiful work, diminishing the connection with "The Lone Ranger" TV show. A few seconds later, orchestra at full tilt and kids in rapt attention, their dad walks by and bellows "Hi-yo, Silver!"

Front-line developers and promulgators of software products have begun to see how beautiful life can be with first-class documentation.

Just as producers and consumers begin to appreciate this touch of value, an authority figure from the user community intrudes to tell us it's all baloney. Right. And you can still drive Model Ts on some highways these days, too.

Brian Wright
Livonia, Mich.

Internet fretting

Talk about history repeating itself! Your front-page story and editorial on controlling Internet surfing ["IS can control Internet surfing, misuse," CW, Feb. 14] remind me of all the arguments I heard from MIS directors about the scourge of PCs 10 years ago.

It's possible employees will waste time and money if they poke around the Internet aimlessly. The same thing was said about early users of Visicalc; all kinds of horrors were predicted for people who had the audacity to fool around with spreadsheets on an Apple II.

It was refreshing to see the IBM spokesman say good managers would manage this supposed Internet problem by noticing a drop in work productivity if someone were "spending too much time goofing off on the Internet."

If IBM can realize it's the results that count and that reasonable people will accept reasonable limitations, maybe there's hope for the rest of corporate America.

Gile E. Gordon
Monmouth Junction, N.J.



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It's time to give IS a break

Michael Cohn

I don't know about you, but I've had it up to *here*. I've had it with consultants claiming we've wandered offtrack. I'm sick of CEOs whining about return on investment.

Information systems is alive and well, thank you. We do *not* need to be re-engineered, rearchitected and refocused. Let me tell you something: PCs are a panacea. Mainframes are messiahs to major industry.

How quickly the top of the organization chart forgets the mission-critical systems we've delivered for 30 years! OK, maybe we've had an abend or two. But for God's sake, information moves U.S. business, and IS moves information (except maybe when we mess up a subroutine).

So I'm taking on all comers. To all the overpaid MBAs and Ph.D.s: Your ignorant criticisms of IS are total flights of fancy. With clenched fist, I have refuted each one below. Go pick on someone else. IS is OK.

► IS is so infatuated with technology that we've forgotten about humanity.

Not true. We know who humanity is; we just try to keep them out of the computer room. And don't blame this technology thing on IS; we thought the 8086 was a waste of time. It was you users who had to have the faster chips and color monitors and teeny-weeny diskettes. We'd be ecstatic if you guys would get off the technology bandwagon and simply let us go

back to the systems and applications we were working on five years ago, especially since we haven't finished any of them yet.

► IS should focus on information, not information systems.

Phooey. I'm tired of this "chicken or egg" argument. I say we just keep installing those really big chickens. Look, when you wanted printout, we gave you printout. When you wanted information, we gave you more printout. What you do with the stuff is your problem. You want it to be *usable*? You want it to be *sharable*? If I were you, I'd just settle for *accurate*, if we ever get the hang of it.

► IS can't help people do their jobs.

Ten years ago, when we were in charge of corporate computing, everything was peachy. Then you decided to take over. You demanded your own servers, networks, CASE tools and data. You wanted to design, develop and maintain your own little systems. Now you say all this stuff hasn't made *your* job easier? That's too bad because it's sure made *our* job easier.

► IS has failed to form coalitions with the rest of the organization to help re-engineer the business.

This is not our fault. We've been trying to re-engineer for a decade. We tell you every year what it will take to drastically change the busi-

ness, but instead the CFO cuts our mainframe upgrade from the budget. Besides, these coalition things never work out. Every time we try to get together, all you really want is for us to come over and set up the PS/1 you got for Christmas.

► IS executives rarely make good business executives.

This type of bigot-

ed thinking has kept us deserving IS folks out of the mahogany offices for three decades. You want someone who can perform under pressure? Make tough decisions? Find solutions to complex problems? We can do all these things as long as someone gives us the specs.

Cohn once worked at a huge computer company and now works at a small computer company. Unfortunately, it's the same company.



Let's go back to the systems and applications we were working on five years ago, especially since we haven't finished any of them yet.

Deluge of opinions on the information highway

Esther Dyson

Well, thanks for all the letters! (And a forgiving, see-what-I-mean smile to all of you who would have written but don't have electronic mail or who have E-mail but not a gateway to the Internet.) I don't want to turn

this column into the information infrastructure corner, but it's clear there's a lot of interest out there.

I got more mail on this topic than on anything else I've ever written. Three factors contributed to this: I asked for a response; I gave an E-mail address (which makes it easy for readers to respond); and people care about this topic.

Indeed, the information highway should make it easy for everyone to communicate. But it won't give people any more time to read or reply to all the information that can be sent to them so easily. So let me summarize what you said.

First, *Computerworld* readers are a pretty

diverse bunch. Librarians, academics and even someone with a Navy return address all wrote suggesting that their special interests and insights should be heeded. Most people, however, didn't say who they were, and I have to assume many of you are information systems people. As they say, on the Internet, no one knows if you're a dog or anything else.

Second, a surprising proportion of you said, and I agree, that the government should keep hands off as much as possible. We may need some regulations concerning freedom, privacy and access, but the free market system is doing a fine job of building and running it, thank you.

A lot of you promoted universal access, but most realized that

it shouldn't be free. If it must be subsidized, needy users should be subsidized directly (or through institutions such as schools and libraries) so that most users pay its true costs and don't waste it. (Yes, each message costs almost nothing, but the structure itself is quite

expensive to build and maintain.)

Finally, many of you intelligently noted that the infrastructure needs to support privacy: private conversations, confidentiality of financial and other records. There are two parts to this need: proper encryption technology and the enforcement of constitutional protections that already exist for privacy and free speech.

The encryption/privacy issue in particular is hot right now. Mitch Kapor, founder of the Electronic Frontier Foundation, and I raised it with Vice President Al Gore at the National Information Infrastructure Advisory Council's first meeting. He agreed that the government's current plans have problems.

Basically, those plans set a standard for an encryption system (known as Clipper or Skipjack) that will allow government officials to tap private communications. Proper authorization is required, and there are safeguards — but not enough in most people's opinion.

Encryption, fundamentally, is a powerful defensive weapon for free people. It offers a technical guarantee of privacy, regardless of who is running the government, the FBI or the National Security Agency. It's hard to think of a more powerful, less dangerous tool for liberty.

Dyson is editor of "Release 1.0," a newsletter on new technology, and "Rel-East," a newsletter on new computer markets in Eastern Europe.

We may need some rules concerning freedom, privacy and access, but the free market system is doing a fine job of building and running the information highway.



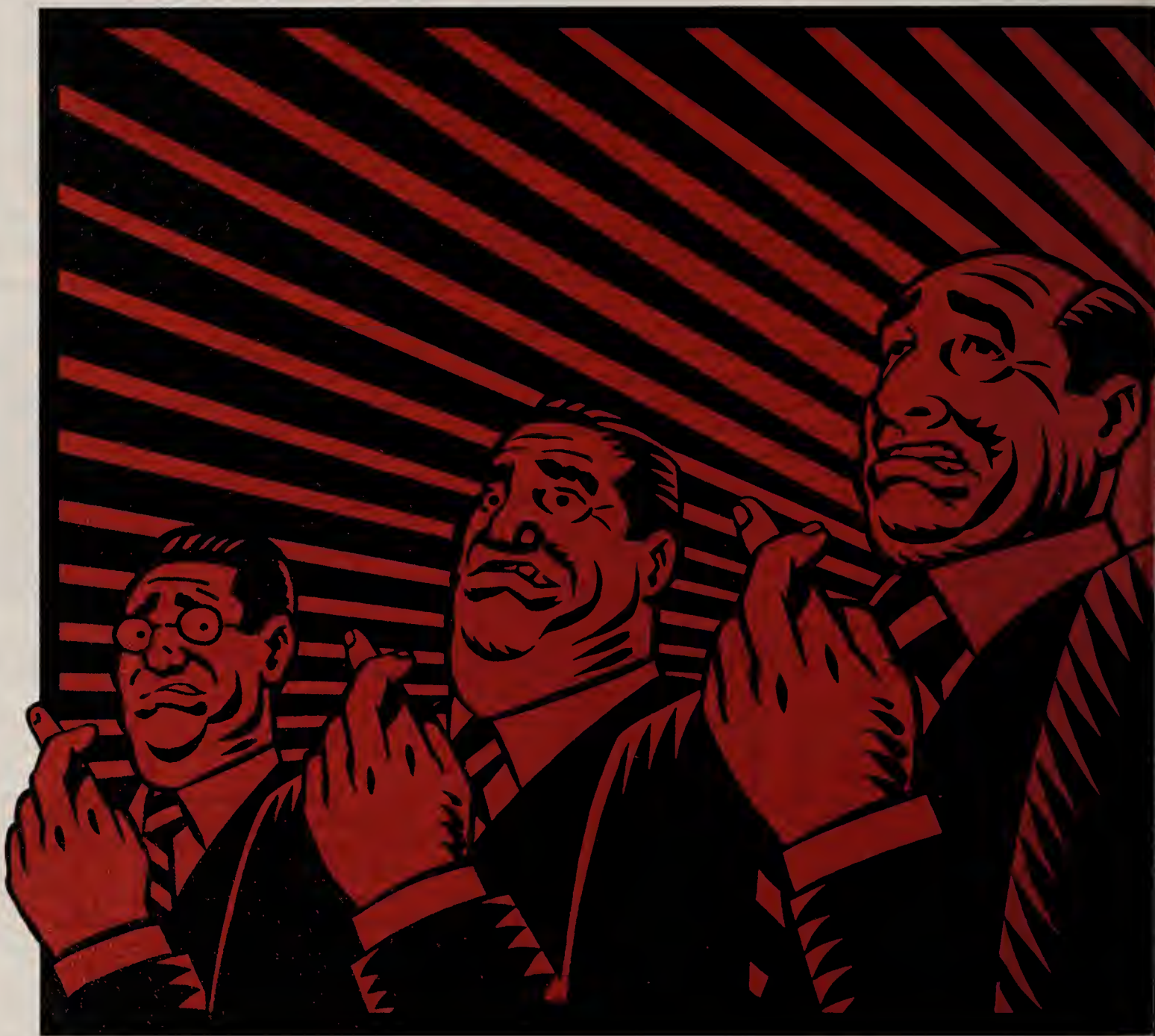
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The reason Microsoft chose the MIPS RISC architecture is simple—raw, unadulterated speed. In fact, NEC's V_R4400 runs Windows NT almost twice as fast as Pentium[™], and nearly four times as fast as the 486[™] DX2/66.*

So before you buy a computer to

run Windows NT, think about what's inside. After all, it only makes sense to choose the quickest processor that processed the program.

If you're responsible for evaluating new PCs running Windows NT, look for the new V_R4400-based systems. They run faster, save you money and even let you use your existing DOS and Windows 3.1 applications.

If you want to discover more about our V_R-Series[™] microprocessors, and to

receive a list of systems vendors shipping V_R-Series based PCs, please call NEC Electronics Inc. at 1-800-366-9782. Or fax us at 1-800-729-9288 and ask for Info Pack #167. For information on NEC MIPS-based PCs, call NEC Technologies, Inc. at 1-800-NEC-INFO.

NEC

Personal computers

Firms foresee boom in end-user support

By Ed Scannell

■ **As large corporate accounts steer their operations toward distributed environments, many information systems departments plan to beef up their support budgets during the next couple of years.**

A survey conducted among 50 Fortune 1,000 companies by Forrester Research, Inc. indicates that some 56% will increase their support budgets this year and next to better grapple with the significant increase they expect in user support and trained personnel to meld complex application solutions.

"End-user support is a weak link in the Fortune 1,000's migration to distributed computing. MIS will have to deal with more users, more software packages and a lot more complex application integration issues," said Heidi Dix, an analyst at Forrester Research's Software Strategy service.

Many observers backed up the report's findings, pointing out that most IS professionals tend to think of the tangibles of hardware and software as the extent of any investment.

"I think [IS departments] in the past

think of hardware and software as their sole investments and forget that user support and training are very important parts of the overall investment," said Bob Holmes, a technical research analyst at Southern California Gas Co. in Los Angeles.

Holmes and others also noted that one of the biggest — and most common — problems in changing to a distributed environment is failure to build the infrastructure to properly support the new environment and to do the necessary application development.

Also overlooked by large corporate accounts switching to distributed environments are contingency or disaster recovery plans, another area to which corporations are dedicating more professionals as they downsize.

Inexact science

However, the typical solution of just "throwing bodies at the problem" will not be any sort of long-term fix, Dix said.

To come up with a meaningful solution, IS departments must take a well-thought-out, more strategic approach to

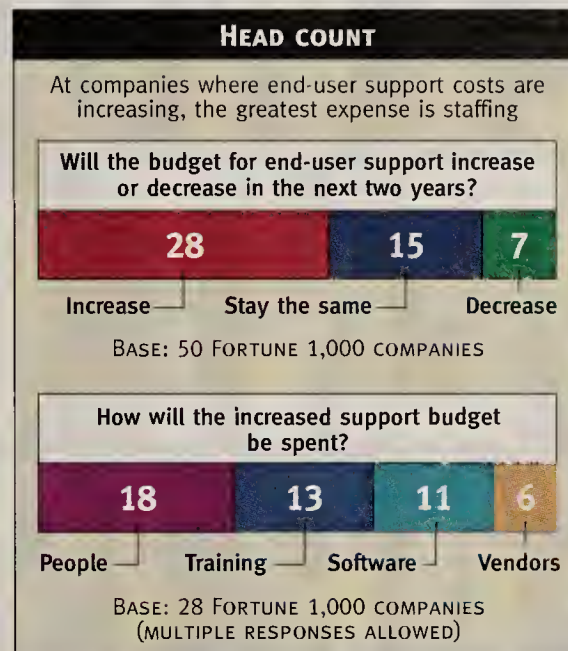
supporting their users. "This means investing in the right technologies that cut the need for a never-ending buildup of support staff," she said.

Overlooked factors include the downtime of workers who cannot get quick answers to their problems and the lost productivity of power users, as well as the ripple effect these two problems have on customer service.

Research among IS departments indicates that most need to adopt a new method of end-user support. Forrester Research's approach, which it calls "Just-In-Time" support, aims to reduce costs, better use its resources and offer support and training targeted at very specific user needs.

To do this, IS departments need to employ new products and application features that make users more self-sufficient; provide themselves with the necessary tools to streamline operations; increase outsourcing for products that have become commodities, which will allow IS to concentrate more on mission-critical technologies; and restructure their support organizations to effectively implement these new efforts.

This four-point plan should help some companies recoup a lot of their wasted time and money and at the same time better equip users to help themselves with low-level problems, thus freeing IS to solve more complex issues.



Source: Forrester Research, Inc., Cambridge, Mass.

One problem in doing this, however, is that most IS departments do not have an accurate fix on exactly how much they spend on support, especially the associated hidden costs, Dix said.

Commentary

Jeffrey Henning

Finding help in odd hours of need



With our concentration on the latest and greatest notebooks and subnotebooks, it is easy to overlook the subtle changes that portable computers are causing in our workplace.

Notebook computers make it possible for people to work around the clock from remote locations.

For instance, I occasionally receive E-mail from my boss at 12:30 or 1:00 a.m. He's checking his E-mail before going to bed. Since I know that he might log on to our network, I find myself also logging on at strange hours. I do this only so that he can see a message from me with a time stamp of some ungodly hour — that way he knows I'm putting in overtime. Think of this as conspicuous computing consumption. Chances are that this type of computing is increasing the use of your network modems.

Workers don't use computers late at night only for status; sometimes it is a necessity.

Whatever the reason, portable computers make it necessary to provide support at strange times and in strange lo-

Henning, page 42

Hardware-only trend rankles users

For some, systems without diskettes flop

By Michael Fitzgerald

Fat software has struck the desktop in an unexpected way: Vendors frequently ship their systems with the software preinstalled on a hard drive and without diskettes.

The policy, in effect for some time at most major vendors, has some users peeved.

"It's extremely consumer-hostile," said Wes Schaffer, senior information analyst at Citgo Petroleum Corp. in Tulsa, Okla.

Schaffer said his main grievance with the vendors, in his case Hewlett-Packard Co. and Apple Computer, Inc., is the amount of time it takes him to make master floppy disks for preinstalled software.

"I spent half a day making master floppies," he said.

Schaffer said he likes having the software come preinstalled on a hard disk but that he would prefer to have floppy disks come with it. But he acknowledged that "some people have accepted [life without

floppies] more than I have."

Emotions run lower at Eastman Kodak Co. in Rochester, N.Y., where "it's a balance between a discounted price to purchase the product and the internal cost [of installing it]," said Bert Boldue,



ROBERT NEUBECKER

manager of corporate sourcing for information technology at Kodak. Boldue said he does not have a specific complaint about the exclusion of floppy disks but that it may raise an issue of whether to go with a master copy agreement vs. a 1:1

rollout of software as vendors begin putting applications on the hard drives.

"We're trying to reduce our costs and our head count, and we have to add people to perform these tasks, so it's not in our best interest," Boldue said.

Staying the course

Despite the unhappiness of some corporate users, PC makers say that overall, the no-floppy policy makes their customers happy, and they expect to continue shipping PCs without floppy disks to corporate accounts.

AT&T Global Solutions, formerly NCR Corp., also ships most PCs with software installed on the hard drive and without floppy disks.

"For us it's been very targeted to large accounts with centralized purchasing," said Joanne Walter, coach of program realization at AT&T Global Solutions. "We were just meeting customer requirements."

Walter said that cutting costs was one reason PC makers

Diskettes, page 41

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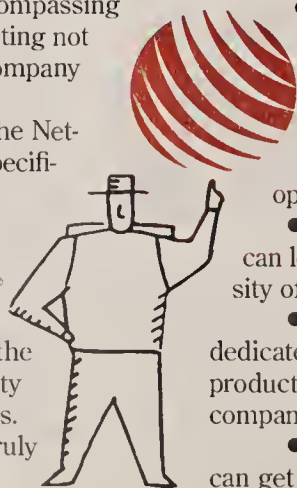
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Computers not seen as casualty of trade war

By Stephen P. Klett Jr.
and Michael Fitzgerald

The recent deterioration of U.S./Japan trade relations could result in both sides placing higher tariffs on imported electronic components, which would mean higher system prices for users. But observers downplayed the likelihood that computers would get involved in the trade war, at least in the short term.

"Whenever you get into these contests, there's always the potential for it to blow up," said James Brennan, an analyst at Work-Group Technologies, Inc., a consultancy in Hampton, N.H. "But I suspect that all that's going on is political posturing, and there will not be any short-term impact."

Other observers added that if Japan were to take more drastic measures, such as raising prices on dynamic random-access memory chips or LCDs supplied to U.S. customers, it would hurt its own market share.

"Essentially, this would cut them off from what is their biggest customer — North America — so they'd really be hurting themselves," said Tony Massimini, an analyst at market research firm In-Stat Research, Inc. in Phoenix.

Korea, for example, has put billions of dollars into boosting its DRAM manufacturing capabilities and would likely be able to meet

U.S. demand, analysts said.

Japan claims the U.S. failed to honor an agreement to reduce tariffs on electronic products such as telephone equipment, televisions and video cameras. The U.S. beef lies mainly with Japan's refusal to open its cellular phone market to U.S. manufacturers and to lower its tariffs on items such as wood and alcohol.

Tensions escalated recently after the U.S. threatened sanctions against Japan as part of a developing trade war over tariffs and closed markets.

"It's a nice game of poker, and I assume somebody will fold at the right time," said Howard Dicken, an analyst at DM Data, Inc. in Scottsdale, Ariz. Meanwhile, U.S. semiconductor manufacturers are keeping a close eye on their overseas competitors.

Michael Maibach, Intel Corp.'s director of government affairs, said the U.S. electronics industry would continue to encourage the government to avoid tariffs.

Tensions between the U.S. and Japan led to an agreement that 20% of Japanese semiconductor purchases would be from the U.S., a figure the Japanese reached in the fourth quarter of 1992 but which has since slipped to the 18% range. Maibach said Intel expects that the number will be in the low 18% range when it is announced in the third week of March.

SPARC notebook manufacturer promises desktop performance

Tadpole Technology may face light demand from users

By Michael Fitzgerald

■ Like its DOS-oriented counterparts, the SPARC notebook can now match the performance of its deskbound fellows. But don't expect to see SPARC notebook sales explode like DOS notebook sales.

Tadpole Technology, Inc. in Austin, Texas, announced its third SPARC notebook — the first that matches the performance of current SPARC workstations. It reaches the level of the Sun Microsystems, Inc. SPARCstation LX. The \$10,950 SPARCbook 3 uses Texas Instruments, Inc.'s 50-MHz MicroSPARC processor and has a thin-film transistor active-matrix color screen, PCMCIA slots and built-in 16-bit audio and Integrated Services Digital Network support with a 520M-byte hard drive.

SPARCbook 3LC has a monochrome display and 8-bit audio for \$7,500.

Both models use the same keyboard and TrackPoint II integrated pointing device as the IBM PC Co. ThinkPad. Both also include Tadpole's Nomadic Computing Environment, a power and remote management tool.

SPARCbook 3 weighs 6½ pounds, which is 2 pounds less than its predecessor; the monochrome version weighs 6 pounds. Battery life is a low one to 1½ hours, though an optional 3½-pound battery pack offers another four to five hours.

While company officials said they think the

market for SPARC notebooks is poised to "grow substantially," at least one analyst said the SPARC notebook market will remain miniscule.

"This is not going to tap some pent-up demand and triple the market share, but it's nice to have something to carry with you" for tasks such as off-site code development and debugging, said John Donovan, an analyst at Work-Group Technologies, Inc. in Hampton, N.H. "It's a nice package and high quality, but it's the kind of thing you'd show to your friend who drives a Porsche."

Donovan added that the SPARCbook has a small screen but runs the Solaris operating system fairly well.

Note-worthy?

Notebook computers make up 25% of the PC market, while only 1% of the SPARC-based workstation market is notebooks.

Triggering growth

Geoff Burr, Tadpole's president, said the \$34 million company should double in size this year. SPARCbooks make up 64% of its sales, although those sales, he acknowledged, are only 1% of the SPARC market. Burr said he thinks the SPARCbook 3 will spur

greater growth for the company, as will Tadpole's IBM RS/6000 notebook, due out in the first half of this year.

Burr also said Tadpole would not enter the mass-appeal PowerPC 603 notebook market pushed by the alliance of IBM, Motorola, Inc. and Apple Computer, Inc. Tadpole may use the PowerPC 603 for building workstation-class notebooks, however.

He also said the company could build a notebook around Intel Corp.'s Pentium chip but has had no requests to do so.

Diskettes

CONTINUED FROM PAGE 39

stopped including floppy disks, in particular to large accounts with sitewide licensing agreements already in place.

A Compaq Computer Corp. spokesman said that "very few" of its corporate customers want or need diskettes with every PC. Compaq cuts the price of the floppies from the price of the PC.

Satisfied customers

Compaq PCs include an installation script that tells the user to back up the hard drive; it appears every time the PC is booted up until the user tells it otherwise. Compaq will also send floppies to users who request them, charging only for the cost of shipment.

The Compaq spokesman said that Compaq has received very few complaints since it began shipping PCs without floppies.

Indeed, there are corporate users for whom the issue might as well not exist.

"We buy DOS and Windows on the hard drive. I've ordered one set of [floppies], and I keep them here in MIS so if anything should happen, I have a set," said Jacqueline Bynsdorp, PC coordinator at Jockey International, Inc.'s headquarters in Kenosha, Wis.

Digital photo bank aids missing-kid search

By Ellis Booker

A pilot program to collect digitized photos of children and make them available to law enforcement was launched late last month in California.

Called K.I.D.S. (Kid Identification Digital System), the project is a joint effort by the Temecula Valley Unified School District, Riverside County Sheriff's Department, Temecula Police Department, Eastman Kodak Co. and systems inte-

grator Applied Network Solutions, Inc. in Rancho Cucamonga, Calif.

Some 9,000 children in kindergarten through eighth grade will have digital photographs of themselves taken and fingerprints made with a Kodak DCS 200 digital camera.

Student participation in the pilot is voluntary, and parents must sign a release form to have the information and images put in the database. A scanned version of the release form is included in the database, which was developed by Applied Network Solutions.

Once recorded by the camera, the digital images will be transferred to CD-ROM using Kodak's PCD writer and matched with biographical information provided by parents. The disks will be stored at the children's school, and the information will be made available to police in missing children cases.

In response to privacy concerns, the sheriff's department and the schools agreed early on that the disks themselves would not be released to authorities.

The project was conceived by Drena Rogers, a Kodak electronic imaging representative in Whittier, Calif., who said she was motivated by a missing child case in which a coroner spent two years trying to identify a body.

The Kid Identification Digital System (K.I.D.S.) combines text and images on digital CDs

According to U.S. Department of Justice figures, more than 1.4 million children are reported missing each year.

Henning

CONTINUED FROM PAGE 39

cations. They also make it more difficult for managers to provide employees with the guidance they need. IS managers can help on both fronts.

Occasionally I end up working late into the night to meet some unrealistic deadline. Wouldn't you know that it's those times I find myself needing help the most. One of my colleagues in Paris was pulling an all-nighter to finish a major consulting project when his hard disk crashed. Then, more than ever, he needed his MIS department, and of course his MIS department was out of reach.

For IS managers, providing computing support to professionals is no longer a 9-to-5 job. IS managers need to consider how to provide assistance to professionals working after hours; often, that's when IS support is most critical. If you work for a large company, you may be able to extend the hours of your help desk. Even if you work for the largest of companies, it may be impractical to have your help desk available around the clock. To provide seven-day, 24-hour support, you may want to consider the following:

- Contracting with third-party support providers for off hours.
- Cascading help across offices in different time zones and different countries (our California office might have been able to help our Parisian consultant, for instance).
- Simply equipping one unlucky soul with a pager and telling him to be on call all night for true emergencies.

Out of sight

In addition to raising round-the-clock support needs, portable computers make it more difficult for mobile professionals' managers. By enabling workers to keep flexible hours and work from a variety of locations, portable PCs keep employees away from their managers.

That makes it more difficult for managers to keep tabs on how employees are spending their time. It also makes it difficult to give employees guidance.

A number of years ago, when our company first considered letting workers telecommute, one of the major issues raised was, "We don't know how to manage people who aren't in the building." Of course, technology — which created this problem — is leaping in to offer a solution.

The remote management of employees

is being facilitated by groupware products such as Lotus' Notes and group schedulers such as On Technologies' Meeting Maker.

Going beyond these, a new category of software, called MBAware by the pundits, provides managers with on-line guidance. One of the best of these products is ManagePro from Avantos Performance Systems. ManagePro provides managers with the ability to manage their employees' goals and progress to-

ward them. It combines the best elements of project management software and personal information managers into a product tailored to help managers manage. It features a complete management book on-line, offering context-sensitive guidance to managers dealing with specific issues, such as an employee's consistent failure to meet set goals.

IS managers can help managers work with remote employees by adopting MBAware products or collaborative soft-

ware. The next time you prepare to purchase portable PCs, spend a few minutes thinking of how those computers will change the way employees work. Then think about what products or services you could offer those employees to help them do their work even better.

Henning is associate director of personal systems and software at BIS Strategic Decisions in Norwell, Mass. He can be reached at 649-6654@MCImail.com.



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New Products

Software

Microrim, Inc. has introduced Power Graph, a Windows-based query and charting tool for its R:Base database management system.

According to the Bellevue, Wash., company, Power Graph combines a visual

query tool with seamless state-of-the-art presentation graphics to make data management and analysis available with the point and click of a mouse.

Users can create standard and statistical queries with the product, which features full database integrity and security through password protection.

Power Graph costs \$99.95 for a single user and \$249.95 for a five-user network.

► **Microrim**
(206) 649-9500

Hardware

Advanced Logic Research, Inc. has introduced the ALR Multimedia Express system, a high-performance multimedia computer.

According to the Irvine, Calif., company, the product includes 4M bytes of RAM, a 50-MHz 486DX2 processor, a 250M-byte hard drive, local bus video, a 16-bit stereo audio card, external stereo speakers, a dual-speed CD-ROM drive, four CD-ROM

titles, a two-button mouse and a 14-in. VGA monitor.

The ALR Multimedia Express system costs \$1,995.

► **Advanced Logic Research**
(714) 581-6770

Toshiba America Information Systems, Inc. has announced the Satellite T1910 series of fully featured, fully integrated 33-MHz Intel Corp. i486-based notebooks.

According to the Irvine, Calif., company, the machines come standard with 4M bytes of RAM, expandable to 20M bytes using 4M, 8M or 16M bytes of user-installable memory cards. Other features include PCMCIA expansion slots, full keyboards and a large display.

Two models are available: the T1910 with a 9-in. super twisted nematic (STN) monochrome display and the T1910CS with a 9-in. dynamic-STN dual-scan color LCD.

Preinstalled software includes DOS 6.2, Windows 3.1 and UltraFont.

Prices range from \$1,599 to \$1,699 for the T1910 and \$2,299 to \$2,499 for the T1910CS.

► **Toshiba America Information Systems**
(714) 587-6200

Canon Computer Systems, Inc. has introduced Innova Vision, a multimedia desktop PC.

According to the Costa Mesa, Calif., company, Innova Vision includes a 16-bit sound card; a dual-speed, 680M-byte CD-ROM drive and speakers; a 210M-byte hard drive and 9.6K bit/sec. fax modem; and PC and multimedia business and entertainment software. The product also features a 14-in. Super VGA monitor.

Standard memory is 4M bytes of RAM that can be upgraded to 36M bytes of on-board memory.

Innova Vision comes with factory-installed software such as DOS 6.2, Windows 3.1, MicroFax communications software and Microsoft Corp.'s Soundbits.

Innova Vision costs \$1,950.
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Just about everyone who's ever used a computer has experienced the same thought: Wouldn't it be great if setting up or upgrading your machine was as easy as turning it on?

The idea is called "Plug and Play." People have been talking about it for years. But now, an ongoing partnership between Compaq and Microsoft, working with other industry leaders, is actually making it happen.

Plug and Play is the result of some very fresh thinking in both hardware and software – an accomplishment that tapped the combined engineering expertise of both companies. Together, Compaq® computers and the next version of the Microsoft® Windows™ operating system (code-named Chicago) will deliver the long-promised benefits of true Plug and Play: easy setup, easy expansion and easy connection to peripherals.

Which means no more configuration headaches. No more hidden switches, cryptic codes or mystery.

Even today, Compaq is shipping computers that will take full advantage of Plug and Play technology as soon as the forthcoming version of Windows is available. So the Compaq & Windows combination will quickly become the standard for Plug and Play computing. A welcome reassurance for people who buy computers.

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The Apple Report On PowerPC

NUMBER 2 — RISC PERFORMANCE AND CROSS-PLATFORM COMPATIBILITY

Many of the most popular applications have been or are being optimized to take advantage of the high-performance PowerPC processor.

PowerPC chips are faster and less expensive than Pentium chips — so are the personal computers they will run.

A complete Macintosh system with PowerPC will cost well under \$2,500, but will offer better performance than higher-priced Pentium-based systems.

With SoftWindows, Macintosh with PowerPC will have the ability to run DOS and Windows applications, unmodified.

For more information about Macintosh with PowerPC, call 1-800-732-3131, ext. 150, in the U.S. We'll send you a copy of our informative, free booklet, *PowerPC Technology: The Power Behind the Next Generation of Macintosh Systems*. In Canada, call 1-800-665-2775, ext. 910.

In the first half of 1994, Apple will introduce a new family of computers that already has the entire computer industry standing on end.

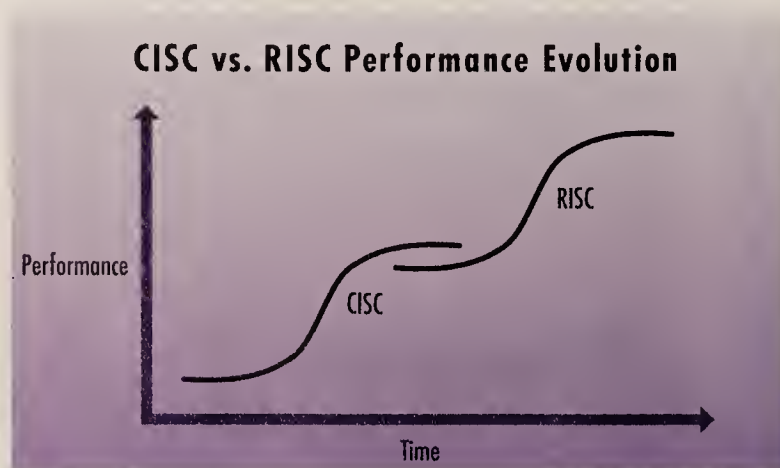
They will offer better performance than computers based on the X86 microprocessors. They will be extremely competitive on a price basis. And they will be compatible with Windows and DOS applications, by using SoftWindows software.

They will be based on the revolutionary new PowerPC™ microprocessor, created jointly by Apple, IBM and Motorola.

For the first time, desktop personal computers will take advantage of RISC chip architecture previously found only in high-performance workstations. This advance will make possible quantum improvements in the way we manage and work with information.

RISC vs. CISC.

Tremendous advances have been made in CISC architecture over the years. However, the physical limitations of the new, high-performance CISC design mean that CISC chips must be significantly bigger and more complex, and must run at hotter temperatures to perform the same tasks as comparable RISC chips. Consequently, the newer generation of CISC chips, like the Pentium, are much more expensive to manufacture. Which means that personal computers powered by PowerPC chips can offer a significant advantage in price as well as in performance.



As you can see on the chart, RISC microprocessors offer dramatically greater potential for growth, leading us well into the next century and increasing the practicality of features like voice recognition, videoconferencing, object-oriented software and multimedia capabilities — functions that will be integral to doing business in the 21st century.

More compatible personal computers.

Apple's new generation of Macintosh® personal computers built around the PowerPC chip offer the ability to run MS-DOS and Windows applications, as well as Macintosh software. Moving from one environment to the next will be seamless and, even more importantly, it will be effortless.



PC users who move to Macintosh with PowerPC will gain access to the large number of new applications which take advantage of the incredible performance of the new PowerPC chip.

Higher-performance optimized applications.

When PowerPC microprocessor-equipped Macintosh computers begin shipping, software developers including Microsoft, WordPerfect, Adobe, Aldus and Claris will begin shipping new versions of their most popular software, specifically rewritten to take full advantage of the new processor's capabilities.

These optimized, sometimes called "native," applications will offer significantly faster performance than their MS-DOS, Windows or current Macintosh counterparts.

Unprecedented value.

Because RISC-based personal computers cost less to manufacture than equivalent systems based on CISC chips, we will be able to make this technology available for well under \$2,500 for a complete mainstream desktop system.* Competitive with a lower-performance, Pentium-based PC.** Watch for Apple Report #3, coming soon.



Unix standards

Systems vendor group to back UnixWare

By Jean S. Bozman
SAN JOSE, CALIF.

Launching a drive to capture Unix desktops, Novell, Inc. last week announced the formation of an industry group that will promote its UnixWare operating system as a single set of binary-compatible system code for users of Intel Corp. PC architecture computers.

The announcement of the Unix Technology Group marks Novell's switch in emphasis from an industrywide supplier of Unix System V source code to a rival of The Santa Cruz Operation (SCO) and Sun Microsystems, Inc. for Unix-on-Intel software applications.

Novell also confirmed earlier reports that it is negotiating the outright sale of Unix source-code rights with several vendors, including Sun. The move could reduce recurring licensing costs for users, but it may also further split the already fragmented Unix market as each systems vendor pushes its own Unix implementation.

Getting their money's worth

Analysts said Novell shed the burden of holding together the Unix standard by conferring the Unix trademark on X/Open Co. in October [CW, Oct. 18, 1993] — and is now trying to earn a swift return on last year's \$300 million-plus purchase of Unix System Laboratories, Inc. from AT&T.

Among the firms joining with Novell on the UnixWare announcement were Unisys Corp., AT&T Global Solutions (formerly NCR Corp.) and ICL, all of which license UnixWare

UnixWare, page 57

SCO to reinforce its Unix system

By Jean S. Bozman
SANTA CRUZ, CALIF.

In an attempt to appeal to more information systems managers, The Santa Cruz Operation plans to fortify its SCO Unix operating system with improved security and reliability features later this year.

The changes will be made just as Novell, Inc. launches a marketing push of its UnixWare operating system as a rival to SCO's Unix-on-Intel system.

The changes to SCO's 9-month-old Open Server 3.0, which are expected to include auditing capabilities, disk mirroring and high-availability features, will be bundled into Release 4.0 by year's end, analysts said. But an announcement could be made by summer — about the time Novell is expected to announce UnixWare 2.0 [CW, Jan. 10], they said.

Reliable system

SCO executives said many of the features can already be obtained by buying optional packages from third-party software firms. Now the objective is to pick the ones that ensure reliable operation and package them with the operating system itself.

"Our strategy is to make sure that all the capacities anyone expects of a minicomputer or mainframe server are available in a SCO system," said Scott McGregor, SCO's senior vice president of products. Among these will be mirroring of business-critical data and features that assure scalability, reliability and performance, he said.

At least one user from a large SCO site said he likes the strategic direction. Bob Goodman, vice president of MIS at Pep Boys, Inc., an automobile parts chain based in Philadelphia, has nearly 400 stores, each running an Intel Corp. i486-based machine as a SCO server that communicates with a central-site IBM mainframe. Every SCO store server has an on-board Sybase, Inc. relational database that can interact with the mainframe's IBM DB2 relational database. Eventually, large stores may have multiple SCO servers sharing data on a LAN.

"We've got to troubleshoot and react from headquarters," Goodman said. "As we keep putting more systems out there, and as we get more dependent on them, we've got to keep raising the standards," he said, citing such areas as data recovery after outages and overall reliability.

SCO markets

According to SCO executives, the company's enhanced servers will fit the following markets:

- **Replicated sales systems**, used in retail and fast-food stores.
- **Corporate servers** that act as navigators for connections to the Internet or to a corporation's private wide-area network.
- **Host systems** for small and medium-size businesses.
- **Branch servers** for large corporations and **local servers** for financial trading applications.
- **The federal government**, which requires Unix and security for many multisite applications.

Other users are not as sensitive to industrial-strength operations on PCs, saying cost and a wide choice of shrink-wrapped application are far more important. In many cases, the SCO system itself

SCO Unix, page 57

NetFrame offers minicomputer-class backup subsystems

By Stephen P. Klett Jr.

NetFrame Systems, Inc. recently began shipping a tape backup system for its line of superservers that boasts backup and restore speeds surpassed only by minicomputer and mainframe-based systems.

According to observers, the Novell, Inc. NetWare-based system fills what has been a major gap for users in large NetWare environments.

With current systems offering backup rates of 1G to 6G byte/hour, the DataJet storage subsystem offers up to eight times faster performance, backing up a maximum of 12G byte/hour, according to NetFrame (see chart).

Grateful for speed boost

Network managers faced with backing up large amounts of data — and a small window of time in which to do it — said this boost in speed is a godsend.

"We have 10G bytes of data residing on a [NetFrame] 450FT that has to be available 24 hours a day. Before this product, there was no way of backing this data up in a timely manner," said Jay McKinney, director of network services at beta site

Complete Health Services, Inc. in Birmingham, Ala. "This fills what has been a black hole for the entire industry."

DataJet consists of a tape array of four to eight 8mm digital audio tape drives housed in an external chassis and a NetWare Loadable Module that resides on the server. The high speed is achieved via compression software and the system's ability to read and write to multiple drives in the array. Up to 28G bytes of data can be stored on an eight-drive system.

In addition to offering faster backup speeds, observers pointed to DataJet's ability to perform volume-by-volume or file-by-file restore at speeds of up to 10G byte/hour as another significant feature.

"This is going to change the way a lot of companies do business," said Lynn Berg, an analyst at Gartner Group, Inc. in Stamford, Conn. "The lack of tools that can back up and restore data in a timely

fashion has been a serious problem," she said.

Previously, companies have had to back up network servers by doing daily incremental backups with a full backup over the weekend. Incremental backups are tedious because large amounts of in-

formation must be synchronized and layered back onto the system to preserve data integrity.

DataJet's speed lets users perform on a nightly basis what used to take several hours over a weekend.

For example, McKinney said DataJet

has reduced what used to be a six- to eight-hour backup process to just under two hours. However, McKinney said he plans to move to an eight-tape configuration split between two I/O processors, which will cut this time in half. Currently, the insurance provider has a single chain of seven SCSI drives connected to a single I/O processor.

No losses

DataJet also includes redundant arrays of inexpensive disks Level 5 software that writes data in parity across all drives in the array, which allows for the failure of any drive or tape in the array without data loss.

In addition, each tape set contains a complete file catalog from which individual files or groups of files can be restored to the local server or any other server on the network, according to NetFrame.

"If you need to back up entire systems in an hour or two at night, this is the solution that makes the most sense," said Michael Kaunitz, a network administrator at St. Paul Reinsurance Corp. in New York.

DataJet is available now at prices ranging from \$22,995 to \$44,995.

Head of the class			
DataJet offers unparalleled performance in the PC LAN backup market			
VENDOR	(GIGABYTE/HOUR)		
	BACKUP RATE	FILE-BY-FILE RESTORE	FULL-SYSTEM RESTORE
NetFrame Systems, Inc.'s DataJet	12	3.1	10
Cheyenne Software, Inc.'s ArcServe	6	3	NA
Palindrome Corp.'s Network Archivist	1.5	1	NA

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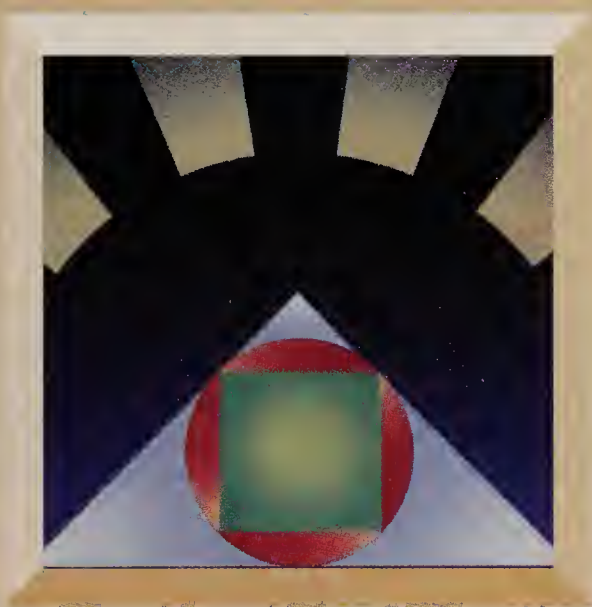
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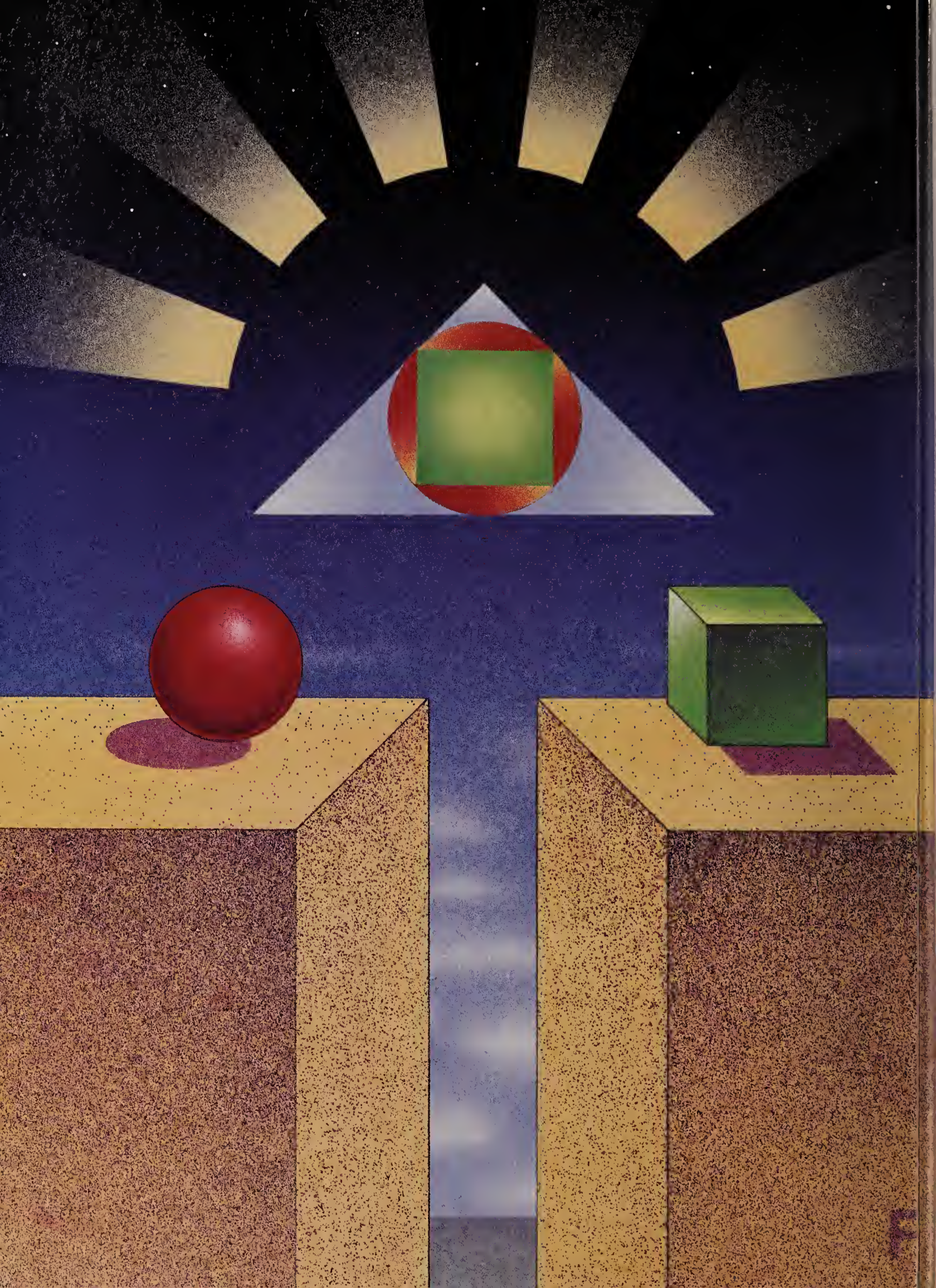
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Page 123

White Paper

IDC
INTERNATIONAL
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Upsizing with Digital's Alpha AXP and Windows NT



Introduction

Upsizing describes the transformation of PC-LAN environments into full-blown production systems. As International Data Corporation's research indicates, users are moving their PC LANs beyond simple file and print sharing. Users are building PC-LAN applications to execute mission-critical functions. These platforms also form the major deployment vehicle for database, decision support, electronic mail, workgroup, and even advanced applications such as multimedia.

Transitions often cause disruptions, but carefully planned strategies can successfully overcome obstacles. As applications are downsized from large systems, and PC LANs become central to users' businesses, three major problems hinder progress — availability of solutions, cost issues and management complexity.

The availability of solutions has as much to do with the quality of the applications, users' familiarity with those applications, and their suitability, as it does with numbers.

Cost issues pertain to the speed of application deployment. A fast deployment results in less development cost and a faster return on investment, especially when development times are reduced from years to months. Relative to these savings, the expenses of additional systems, memory and other hardware are insignificant.

Management complexity is a key hindrance to moving production applications onto PC LANs. Without the ability to deliver consistent performance and reliable access, PC LANs cannot function in mission-critical environments. Users will be reluctant to buy more systems or applications until the complexity of managing centralized and distributed sites is reduced.

Recognizing that upsizing PC-LAN environments presents new challenges, Digital Equipment Corp. and Microsoft Corp. partnered to offer currently available solutions to these upsizing obstacles. Digital offers the hardware, Alpha AXP — an aggressive RISC processor, leading price/performance, support for multiple operating systems and compliance with industry standards. Microsoft's Windows NT Advanced Server contains an equally strong list of attributes: 32-bit and multiprocessor support, built-in networking, and access to 50,000 DOS and Windows applications. The Intel-NT combination has had stronger sales than the Alpha AXP-Windows NT solution, but the latter partnership does yield some decided benefits.

Overall, the Digital-Microsoft collaboration presents LAN users with a solid growth path for deploying production applications.

*This White Paper is written by Chris Christiansen,
director, worldwide commercial research, IDC.*

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Upsizing with Digital's Alpha AXP and Windows NT

Users want to expand their PC LANs beyond simple file and print capabilities, but they experience many obstacles when upsizing these platforms to robust client/server application environments. Users' objections to upsizing with Digital Equipment's Alpha AXP and Microsoft Windows NT Advanced Server can be grouped into three categories: availability of solutions, cost issues and management complexity. With Windows NT Advanced Server, Digital and Microsoft have made solid progress toward providing most of the necessary components for PC-LAN upsizing.

Against these three categories, the Alpha AXP-Windows NT combination fares well. Alpha AXP systems running Windows NT are capable servers for departments and workgroups. Moreover, IDC believes that the Windows NT Advanced Server market will develop independently of the Windows NT client market because of NT's limited success at the desktop level. And NT's support for heterogeneous networking environments and its hardware independence provide a robust platform for database software and other applications.

On the other hand, the Alpha AXP-Windows NT combination currently suffers from some limitations, e.g., it is not particularly well suited for file sharing. Also, the current Alpha AXP product range is limited to a single server model and application tools are in short supply.

The Digital and Microsoft combination yields considerable returns. Digital contributes decades of networking experience, 10 years of

client/server history, and a worldwide service and systems integration expertise that is unequaled among all the vendors supporting Windows NT. For its part, Microsoft created

Windows NT and made it compatible with tens of thousands of existing applications. It will also provide next-generation native applications and systems software to exploit Digital's Alpha AXP architecture. However, most of these applications run in emulation mode with a performance degradation.

In 1993, IDC surveyed 300 LAN managers as part of its Global IT Survey. Their responses (Figure 1) indicate that LAN server plans are going in several directions. The largest group (38.7%) is adding new servers dedicated to applications. As expected, another large group (28.6%) is upgrading existing servers with more memory, faster networking interfaces, increased storage, and more robust back-up devices. The smallest group (10.8%) is actively consolidating its servers

onto fewer, more powerful platforms. While 21.9% of the respondents indicate no significant change to their LAN server strategies, the vast majority (78.1%) clearly predicts revisions in their plans as LANs become more central to their business operations.

UPSIZING WITH DIGITAL AND MICROSOFT

As previously mentioned, users'

objections to upsizing with Digital's Alpha AXP and Microsoft Windows NT Advanced Server can be grouped into three categories — availability of solutions, cost issues and management complexity. With Windows NT Advanced Server, Digital and Microsoft have made surprising progress in providing the necessary components for upsizing and overcoming these user objections.

AVAILABILITY OF SOLUTIONS

The availability of solutions is based on more than simply counting the number of commercial software packages. This area also includes access to other networked applications via WAN connectivity and vendors' ability to quickly fix problems at a low cost to the user — service and support.

Users are also migrating their mission-critical applications to NT because of its links to the huge base of installed Windows users.

Commercial Applications

NT's availability on multiple vendors' hardware at a variety of price and performance levels is a powerful attraction for independent software vendors (ISVs). This availability will translate into software support with native applications. At present, Digital offers roughly 300 native 32-bit applications for Alpha NT from prominent vendors such as Powersoft, Autodesk, Welcom Software Technology and Sapiens. With over 700 software vendors committed, IDC expects more than 1,000 native Alpha NT applications by early 1995.

The availability of Microsoft's SQL Server is a major reason that many users choose Windows NT. This software enables many users to reduce application development times.

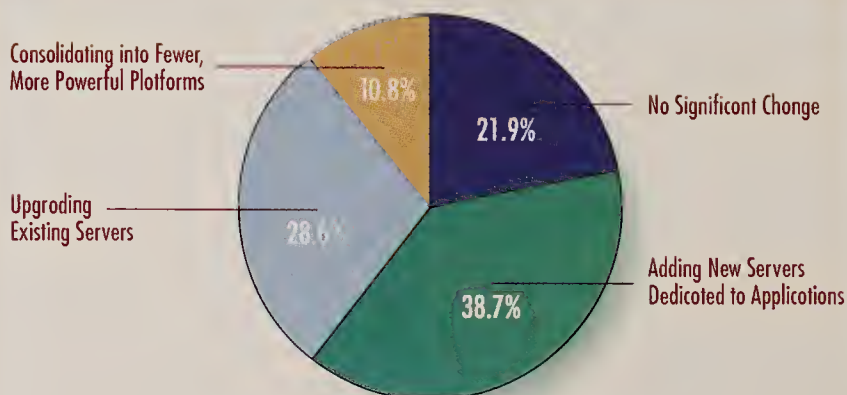
Early users report a task that

Digital and Microsoft have made surprising progress in providing the necessary components for upsizing.

The availability of Microsoft's SQL Server is a major reason that many users choose Windows NT.

USER LAN SERVER STRATEGIES

Figure 1



Source: International Data Corp.

would have taken years on a larger system is developed, tested and deployed in only a few months on an Alpha AXP-Windows NT platform. Moreover, these are client/server applications that increase the utilization of existing Windows hardware and software. Most significantly, users usually perceive no changes except faster data access and lower response times.

Wide Area Network Connectivity

Microsoft recently shipped SNA Server for Windows NT on Intel; we expect the Alpha AXP version to lag by only a few months. For Alpha

AXP, this software enables PCs attached to NT Advanced Server to access IBM mainframes and AS/400 minicomputers via 3270 and 5250 communication protocols.

Terminal emulation software vendors such as Digital Communications Associates and Wall Data are already shipping supporting products. Other communications vendors such as Atlantis and Attachmate plan to support SNA Server with both hardware and software. SNA Server supports multiple clients (Windows, Windows NT, Windows for Workgroups, MS-DOS, Macintosh and OS/2) and protocols (NetWare's IPX, Unix's

TCP/IP, Macintosh's AppleTalk, and IBM's NETBEUI).

Service and Support

Because Windows NT is a new environment and Microsoft's service is geared towards PC-oriented telephone support, it is hardly surprising that Microsoft readily admits that Digital's partnership effectively counterbalances its own weakness. Of all Microsoft's Windows NT partners, we believe that Digital offers the strongest combination of worldwide experience with support, professional services and systems integration. It maintains 14,000 products from 1,300

Shell Strikes Oil with Alpha AXP and Windows NT

A long-time LAN Manager shop, Shell Oil's Martinez Manufacturing Complex recently placed into production a Digital Alpha AXP system running Windows NT. The San Francisco Bay Area facility developed an SQL Server-based application that contains a database of process and laboratory information.

Close to 550 LAN-based users who are spread over two square miles query the database for instrument and sample readings. Users then are able to move data to Excel or Lotus spreadsheets for subsequent graph preparation. Shell also uses the Digital Alpha SQL Server as a repository for maintenance and equipment data downloaded nightly from an MVS/CICS system.

These applications were originally implemented on IBM MVS DB2 and VM SQL/DS databases. Mark Thomson, Shell Oil systems analyst, reports that development costs were conservatively one-tenth those on the VM mainframe. Thomson says, "Besides being faster to develop than mainframe-based Cobol applications, Alpha AXP-Windows NT applications are easier to use and offer users better response times." Also, the annual savings in mainframe disk storage was more than enough to pay for the Digital processor.

Shell concluded that because its organization had evolved to the point where people's jobs were more cross-functional, it was necessary to provide a computing architecture that made that method of operation as easy as possible.

"We are looking to migrate many applications from our mainframe systems to a LAN-based client/server architecture during the next two years. With products like Digital Alpha AXP and Windows NT SQL Server, it looks as though the technology is mature enough to support this shift," Thomson says. "Until recently the software and hardware available for client/server systems weren't rugged enough and didn't provide the performance we need to support major systems."

The Martinez refinery has made this move based on results and pricing. And it manages the client/server network with a combination of locally-written applications and off-the-shelf software from a variety of vendors.

"We are pleased how well the Digital Alpha AXP has fit into our environment. There was no problem getting it into our token ring system and communicating with both local workstations and our mainframes in Houston," Thomson says. He adds that the Digital Alpha AXP-Windows NT SQL Server combination has been extremely reliable and has not crashed since it was brought on line.

For Shell's Martinez refinery, the price/performance of the Alpha AXP-Windows NT approach was better than other options it evaluated. "Both Digital and Microsoft have positioned their hardware and software very well. It's hard to beat this combination," says Thomson.

vendors with 35,000 support professionals and 7,000 systems integration specialists.

COST ISSUES

NT Advanced Server acts as a locus for LAN applications — file, print, communication, database, workgroup, etc. As such, we believe it is more versatile than other environments. It runs applications, especially database applications, more efficiently than other network operating systems, especially Novell NetWare.

At the server level, Windows NT's appetite for hardware is not a prohibitive factor. Due to its strength in the areas of investment protection, scalability, availability, price/performance and vendor experience, the Alpha AXP-Windows NT combination negates the importance of hardware cost issues.

Investment Protection

Investment protection involves preserving user investment in data and applications without costly and

disruptive ports, rewrites, recompiles and conversions. Windows NT's hardware independence comes from its ability to run on three different processors: Digital's Alpha AXP, Intel's x86, and SGI's MIPS. This level of hardware support provides users with both competitive leverage and freedom from any single vendor.

And with Digital's new XL series, users can purchase NT for Intel x86 platforms now, and upgrade to Alpha AXP systems in the future.

Scalability

Scalability is the ability to move applications onto larger platforms, while supporting more users and larger workloads. Unlike other networking and operating system environments that cannot readily migrate up or down, NT's symmetric multiprocessor (SMP) capability provides a high degree of scalability. Upsizing is a three-dimensional process that involves moving PC-LAN environments upward towards more production environments, bringing mission-critical applications down-

ward to less costly platforms, and moving these mission-critical applications outward into distributed environments. NT Advanced Server enables users to drive their application environments in all three directions.

Price/performance

While price/performance is a leap-frog game with any single vendor holding only a transitory advantage, Digital's Alpha AXP currently has the leadership position in this area. Granted, only two Alpha AXP models (a \$5,000 PC/server and a \$10,000 server) currently run Windows NT, but IDC expects a full range of systems by mid-1994. By this spring, we believe Digital will announce several low-cost systems for under \$50,000 with

low-end SMP and clustering capabilities.

MANAGEMENT COMPLEXITY

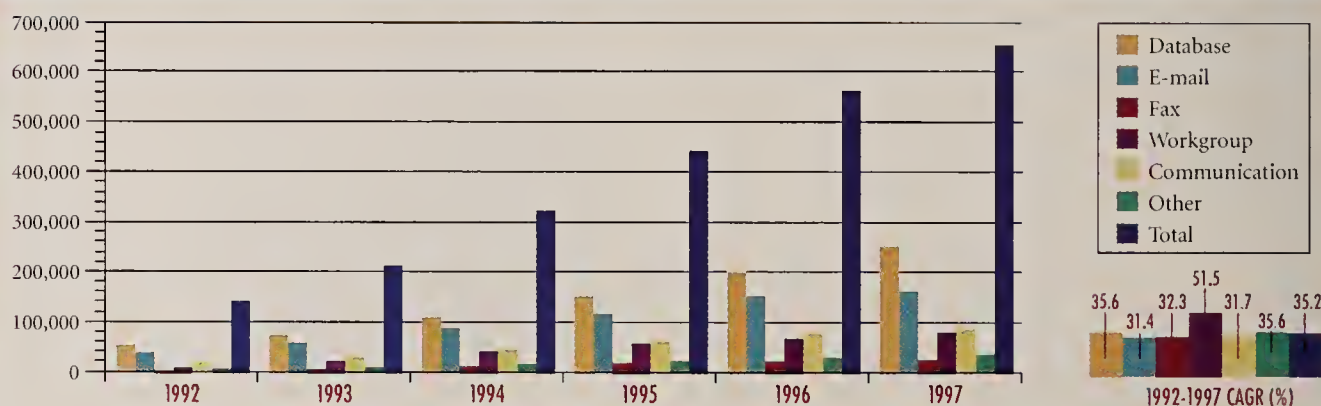
Management complexity largely involves running multiple tiers of clients and servers in heterogeneous

Windows NT runs on Digital's AXP, Intel's x86 and SGI's MIPS.

NT's symmetric multiprocessor (SMP) capability provides a high degree of scalability

WORLDWIDE APPLICATION SERVER SHIPMENTS BY APPLICATION

Figure 2



Source: International Data Corp.

environments at a time when users are seeking less complex, less expensive architectures. In early November 1993, Microsoft announced an agreement with Computer Associates (CA) to port CA-UNICENTER, a highly integrated Unix-based network management platform, to Windows NT.

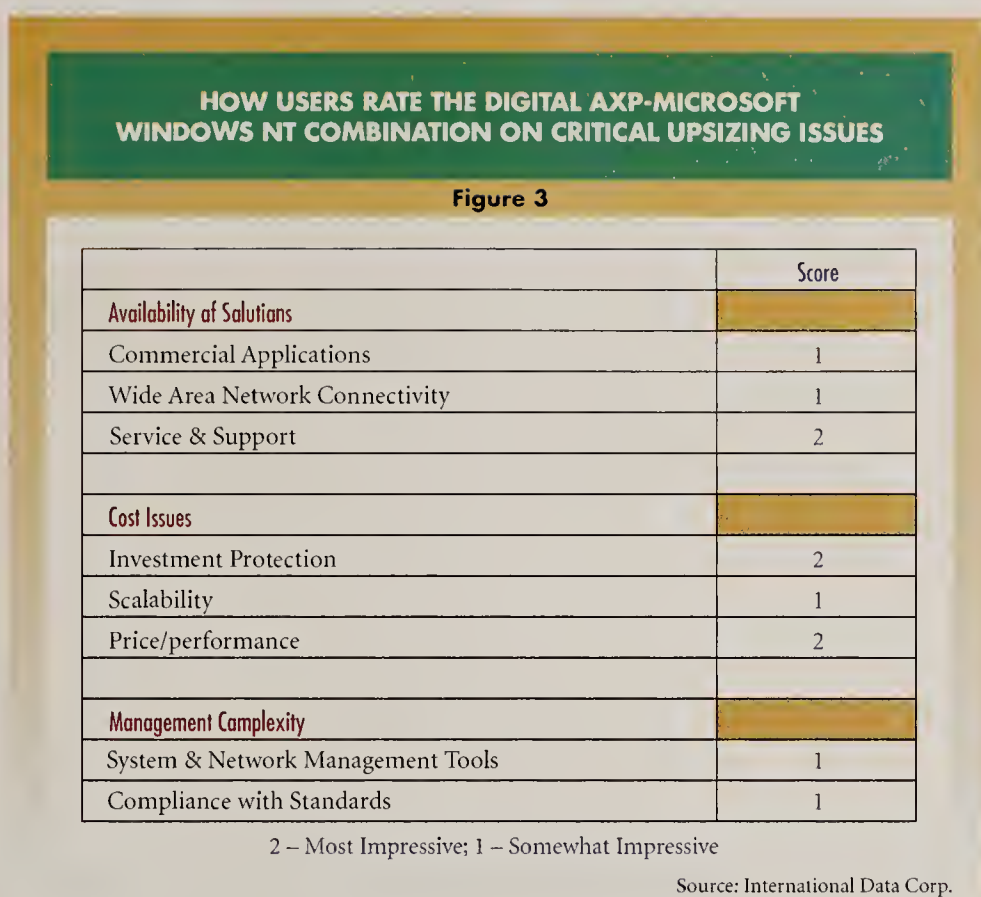
In mid-November, Digital, Microsoft and IBM announced plans to link NetView, which Digital licenses from IBM, and Microsoft's Hermes, an unreleased suite of systems management utilities for workgroups. In the same time period, HP also announced its intention to ship NT client support during the first half of 1994, and to work with Hermes.

Digital and IBM will work together on the NetView port to Windows NT and the Hermes extensions. Microsoft will orient Hermes towards systems management at the workgroup and departmental levels. Hermes will manage clients and small servers, handling such tasks as software distribution, fault notification and configuration management. It will also offer inventory management, remote monitoring and interfaces to other management platforms, such as Digital's Polycenter NetView, IBM's NetView, HP's OpenView, and Computer Associates' CA-UNICENTER.

For enterprise management at the system and network level, Hermes will pass information to NetView. In this environment, NetView will act as a consolidated console, focusing on network management. Microsoft expects to ship Hermes with NetView extensions by mid-1994. We expect Digital and IBM to finish the NetView port by late 1994.

Compliance with Standards

With NetView and OpenView support, Windows NT will become compliant with de facto network management standards. At present,



Windows NT includes a Simple Network Management Protocol (SNMP) agent. It enables current SNMP-based management platforms, e.g., Cabletron's Spectrum and Synoptics' Optivision, to manage NT clients and servers. These functions permit users to fit Windows NT into existing management environments.

CONCLUSION

The combination of Digital's Alpha AXP and Windows NT Advanced Server contains several positive attributes. Its robust performance enables rapid application development with currently available database and programming tools.

Presently, tool and database support is somewhat limited, but the situation will improve over the next 12 months. Windows NT Advanced Server already offers built-in networking and security via password log-on and support for multiple accounts. And users can upsize today with Alpha AXP.

The integrated systems management utilities will have far more in common with mid-range environments than other network operating systems. Other current functions include solid multitasking and fault isolation for applications, which means their failure does not bring the server down. This is especially important in bringing mission-critical applications to LANs.

Finally, Windows NT runs most DOS, Windows, OS/2 character-mode and POSIX applications. The combination's application base of native software will remain somewhat lean in comparison with the Intel-based software library. Nevertheless, the Alpha AXP-Windows NT Advanced Server is already helping users upsize their LAN environments and downsize applications from large systems. ■

Multitasking and fault isolation are important in bringing mission-critical applications to LANs.

Writing
Windows

**Upsizing with Digital's Alpha
AXP and Windows NT**

UnixWare

CONTINUED FROM PAGE 47

source code and had belonged to the Unix International, Inc. consortium. Nine vendors have agreed to join the group already, and Novell has been trying to line up more. Each can modify UnixWare code by "adding value" above the base code, Novell said.

The firms joining the UnixWare group "are saying that their flavors of Unix will eventually become one binary, which is UnixWare," said Scott Winkler, a program director at Gartner Group, Inc.'s Software Management Strategies group. That would create a single, unified UnixWare market as a high-volume target for independent software vendors and value-added resellers. However, it could be several years before a single binary actually exists, Winkler said.

There will be one UnixWare implementation from Novell going forward, but 100 companies — including SCO and Sun — still pay royalties to Novell for Unix System V source code. Now, some licensees are trying to distance themselves from Novell. Sun Chief Executive Officer Scott McNealy acknowledged earlier this month that subsidiary SunSoft, Inc. is considering a onetime buyout of its Unix royalties from Novell "if they come up with a good number." Others are also ne-

gotiating to walk away from source-code contracts, said Biff Traber, director of Novell's Unix System Group in Summit, N.J.

McNealy said the proposed SunSoft buyout of future royalties, which analysts pegged at about \$100 million, will not change Sun's plans to develop Solaris. "We're free to do whatever we want, anyhow," McNealy said. "We don't go to [Unix System Laboratories] for any new incremental technology."

SCO Unix

CONTINUED FROM PAGE 47

is overshadowed by the shrink-wrapped application and relational database that run on top of it.

SCO's best calling card may be its support for a wide variety of Intel-based PC platforms, said Scott Winkler, a program director at Gartner Group, Inc.'s Software Management Strategies group. "They are strategically pointing themselves at purchasers who are making multisite distributed server purchasing decisions," he said, noting SCO's business server strategy. "If all SCO can do is be functionally equivalent to the RISC-based systems, then they'll win because they're less expensive."

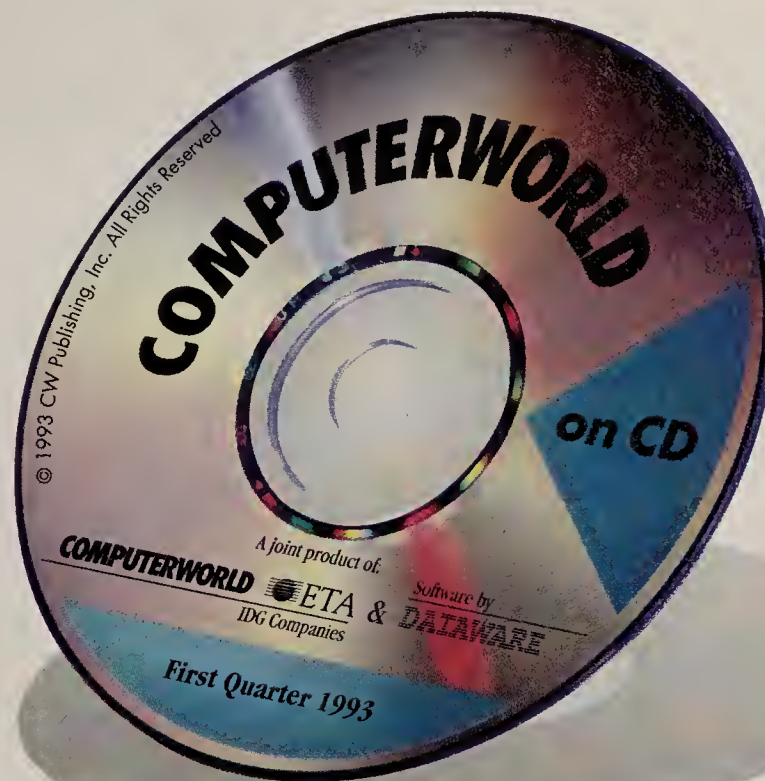
Other analysts said SCO must compete with two other Unix-on-Intel packages, Novell's UnixWare and SunSoft, Inc.'s Solaris X86 for Intel machines. However, UnixWare sales for 1993 were about one-fifth of SCO Unix sales in 1993, according to International Data Corp., and Solaris X86 sales for Intel have not yet taken off, analysts said.

Winkler said he believes another large competitor is ready to supply PC servers in distributed IS operations — Microsoft Corp. with its Windows NT, which will build up volume shipments this year. "SCO is clearly at a crossroads," Winkler said. "They will either continue to build momentum or face the specter of competing products from Microsoft or Novell."

Pizza Hut, Inc. in Wichita, Kan., developed custom software utilities to handle systems management and reliability functions for about 4,000 stores with Unix machines, including about 400 SCO Unix servers.

"These systems run the core of our business, so they've got to work," said Jon Payne, director of point-of-sale systems. SCO is the standard Unix server for all new stores, but the next SCO release will be tested for compatibility with AT&T Unix systems installed at most Pizza Hut outlets. Until then, he said, "We've got administrative procedures and workarounds that work really well for us now."

SCO sold about 185,000 copies of its SCO Unix operating system in 1993, according to International Data Corp.; Novell sold about 35,000 copies of its UnixWare system.



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NetWare

MIKE

MARY

PAUL

S. WALDRON

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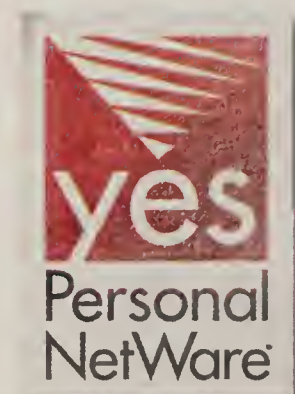
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Briefs

Symbus unveils Face-To-Face

Symbus Technology, Inc., a Waltham, Mass., software developer, has introduced Face-To-Face, a system designed to verify whether a person is who he claims to be by matching his face to a previously taken picture. The software, which is expected to become commercially available this summer, could potentially be used to verify identifications for access to buildings, use of automated teller machines and health benefits.

Sybase meets rules

Sybase, Inc. has released a tight-security version of its SQL Server database that meets the federal government's B1 level limited access rules. The product, priced between \$5,625 and \$139,000, runs on specialized high-security workstations from Sun Microsystems, Inc. Ports of Secure SQL Server to machines from Digital Equipment Corp. and IBM are under consideration, Sybase said.

DSC purchases Oracle apps

DSC Communications Corp. has purchased \$3 million worth of Oracle Corp.'s client/server financial, manufacturing and human resource applications.

CA ships RS/6000 tool

Computer Associates International, Inc. has begun shipping a beta version of CA-Unicenter for AIX, a systems management package designed for IBM's RS/6000 platform.

In support of NetWare

AT&T Global Solutions (formerly NCR Corp.) has added support for Novell, Inc.'s NetWare users, as well as remote workstations not connected under a network operating system, in Version 2.0 of its StarSentry Software Manager. The package was designed for systems administrators to distribute applications to Unix, OS/2 and DOS systems from a single console over LANs and wide-area networks. It is shipping with a base price of \$15,000.

Windata unveils wireless LAN

Windata, Inc. in Northboro, Mass., unveiled its first wireless LAN product family for campus environments. The Air-Port wireless hubs can be used to

connect buildings up to 1.8 miles apart and provide 5.7M bit/sec. of data throughput via spread-spectrum radio bands. Windata said the system is fully compatible with Ethernet wired networks. Pricing starts at \$12,450.

Xnet announces hub card

Xnet Technology, Inc. in Milpitas, Calif., announced a server-based Ethernet switching hub card targeted at 20- to 100-port NetWare networks. The card

has six full-bandwidth Ethernet ports that support up to 60M byte/sec. of data throughput via a direct interface with the host's XT/AT bus or Extended Industry Standard Architecture (EISA) bus. XT/AT versions are slated to ship in April, starting at \$2,688. EISA versions will follow in May, starting at \$3,288.

Compuware integration plans

Compuware Corp. in Farmington Hills,

Mich., said it had agreed with NetLabs, Inc. in Los Altos, Calif., to integrate its EcoTools systems management software with NetLabs' network management system.

SCO to ship Wintif

The Santa Cruz Operation's IXI Ltd. subsidiary said that it will ship a developer's copy of IXI's Wintif Motif-compatible Windows interface for Intel Corp.-based PCs that run Unix.

Contrary to p this is not the first step in impl

Ironic, isn't it? Companies across America are being led to think raising productivity through workflow means razing their enterprises right down to the ground.

Introducing workflow that works. Wang's OPEN/workflow software. It's by far the simplest way to tie workflow to all your enterprise's structured activities—including your legacy applications. So you can build on what you've got. Instead of starting from the ground up.

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New Products

Borland International, Inc. has introduced several Unix versions of the dBase IV database.

According to the Scotts Valley, Calif., company, the dBase products are available for SunSoft, Inc.'s Solaris, Novell, Inc.'s UnixWare, the Santa Cruz Operation's SCO Unix and other Unix operat-

ing systems. Features include high-performance filters for fast queries; sophisticated user interface commands; more than 70 new language enhancements, including mouse-event handling; and the ability to open up to 40 database work areas simultaneously.

A single-user license for dBase IV for Unix costs \$795. Additional user licenses are available for \$425 each.

► **Borland**
(408) 431-1000

PC Docs, Inc. has introduced PC Docs Open Version 2.0, a Windows-based document management system.

According to the Tallahassee, Fla., company, the product offers PC Docs Mobile, a feature that lets users check out one or more documents and their profiles for remote editing and reference.

PC Docs Open includes a directory-monitoring feature that tracks files and documents created in nonintegrated applications.

Users can automatically track document production statistics with a Cost Recovery module.

PC Docs Open costs \$299 per workstation and \$495 per server. PC Docs Mobile costs from \$20 to \$50 per user.

► **PC Docs**
(904) 942-3627

On Technology Corp. has introduced Notework 3.0, a LAN electronic-mail package.

According to the Cambridge, Mass., company, Notework 3.0 offers a Windows interface and a button bar menu that enables users to point and click on items that represent the E-mail tasks they use most frequently.

System features include scroll bars, dialog boxes, pull-down menus, resizable windows, clipboard support and the ability to change the system's fixed pitched fonts.

Notework 3.0 pricing starts at \$59 per user for a 10-user license and \$49 per user for a 50-user license.

► **On Technology**
(617) 374-1400

Information Management Co. has introduced Tuxedo and OpenTransport for SunSoft, Inc.'s Solaris 2 operating environment for SPARC- and x86-based systems.

According to the Edison, N.J., company, the Tuxedo system offers state-of-the-art transaction management, including dynamic load-balancing and transport-independent automatic transaction routing and prioritization.

The product performs systems administration facilities such as dynamic application definition tuning, dynamic server reconfiguration and natural language diagnostic and message systems, the company said.

OpenTransport for MVS enables Tuxedo users to transparently execute MVS Information Management transactions.

Tuxedo prices range from \$1,200 to \$79,000. OpenTransport prices range from \$59,000 to \$95,000.

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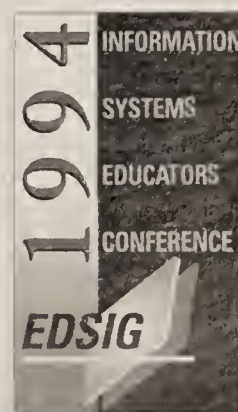
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GETTING SOFTWARE TO WORK GETTING PEOPLE TO WORK



WITH A SIMPLE COMMAND, LUCY
LAUNCHES FROM NOTES INTO THE TRAVEL
AUTHORIZATION FORM IN **AMI PRO** TO PREPARE
FOR HER TRIP TO SPORTS WORLD. NOTES HAS
ALREADY FILLED IN MOST OF THE TEMPLATE
WITH LUCY'S FILE INFORMATION. SHE FILLS
OUT THE REST OF THE INFORMATION AND THE
TRAVEL DOCUMENT IN NOTES IS UPDATED.

2

Ami Pro - Travel Request

Text Style Page Frame Tools Window Help

MERCURY SPORTS

Travel Authorization Request

Employee Information

Lucy Rowland Employee Number: 4001
Shoe Design Engineer

Department Name: Irvine Design Facility Department Number:

Trip Information

Brief trip description: SportsWorld '94 Destination(s): Miami
Departure Date: 2/1/94 Estimated cost of trip:
Return Date: 2/5/94 Cash Advance Requested:

Authorization from Accounting

Travel Authorization Number: 2536 Cash Advance Amount: 500

THIS **NOTES** APPLICATION SHOWS HOW A COMPANY CAN
AUTOMATE THE TRAVEL PROCESS. HERE, **NOTES** CONTAINS THE
AMI PRO TRAVEL REQUEST, THE FREELANCE TRIP PRESENTATION AND
THE 1-2-3 EXPENSE REPORT. ANY AUTHORIZED MEMBER OF LUCY'S
WORKGROUP MAY ACCESS, SORT AND REPORT ON THE DATA
BECAUSE OF THE NEW **NOTES/FX** TECHNOLOGY.

1

JANE, THE DEPARTMENT MANAGER, CAN
QUICKLY DO A CHECK TO SEE WHO HAS
EXCEEDED THEIR PLANNED EXPENSES BY
VIEWING FROM WITHIN **NOTES** THE ESTIMATED
EXPENSES (FROM **AMI PRO**) AGAINST THE
ACTUAL EXPENSES (FROM 1-2-3).

5

Lotus Notes - Expense Estimate vs. Actual

Date	Description	Estimated	Actual
02/25/94	SportsWorld '94	\$3,600	\$4,697
01/18/94	Customer Call - Bay Sports	\$2,000	\$3,207
		\$1,600	\$1,490
	Kathy Carbonneau	\$6,500	\$5,813
01/27/94	International Business Review	\$5,000	\$4,221
02/10/94	Domestic Marketing Review	\$1,500	\$1,592
	Lucy Rowland	\$11,000	\$9,612
	SportsWorld '94	\$2,000	\$1,875
	Korean Factory Assessment	\$9,000	\$7,737
		\$21,100	\$20,122



Lotus Notes - Travel Process - All

File	Edit	View	Mail	Compose	Text To
Departing Report					
Complete					
Kathy Carbonneau					
1/16/94 - International Business Review					
TAR 3209	01/07/94	Munich			
EXP	01/27/94				
TR	01/27/94				
Lucy Rowland					
1/10/94 - Korean Factory Assessment					
TAR 3251	01/03/94	Seoul			
EXP	01/21/94				
TR	01/21/94				
2/1/94 - SportsWorld '94					
TAR 2536	01/15/94	Miami			
EXP	02/18/94				
TR	02/18/94				
Pending					
Jack Armstrong					
1/10/94 - Customer Call - Bay Sports					
TAR 2909	01/06/94	San Francisco			
EXP	01/18/94				

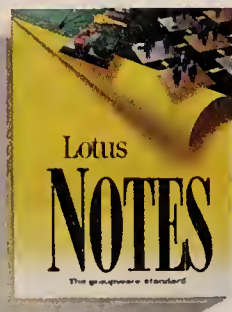
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sense of shared data by letting each user know who
made what changes when and why.

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WORK TOGETHER IS SOMETHING. NOT WORKING TOGETHER IS EVERYTHING.

Freelance Graphics - Trip Presentation

Mercury Sports
Trip Report

**SportsWorld '94
Miami
February 1 - 5**

Select New Page button below
and choose Key Business Reasons

Returning	Expense Total
1/22/94	\$4,220.70
1/15/94	\$7,736.70
2/5/94	\$1,875.44
1/11/94	\$1,489.92

Lotus 1-2-3 Release 4 - Expense Report

Mercury Sports
Employee Expense Form

Emp # 4001 Dept # 172 Dept Name Irvine Design Facility Saturday W/E Date 02/05/94 TAR # 2536

Use of travel and nature of business Destinations Miami

	01/30/94 Sun.	01/31/94 Mon.	02/01/94 Tues.	02/02/94 Wed.	02/03/94 Thurs.	02/04/94 Fri.	02/05/94 Sat.	Total
Room		1194.00						\$1,194.00
Food			12.24	10.00	8.52	12.00		\$42.76
Transportation			5.00	24.00	32.00		20.00	\$49.00
Entertainment			46.00					\$46.00
Telephone			127.92	127.92	127.92	127.92		\$513.76
Total	\$0.00	\$1,194.00	\$191.16	\$161.92	\$168.44	\$139.92		\$2,865.44

SUMMARY

Total Expenses	\$1,875.44
Advances**	\$500.00
Balance Due Mercury Sports	\$0.00
Balance Due Employee	\$1,375.44

3 WHEN SHE RETURNED FROM HER TRIP, LUCY CREATED A PRESENTATION REPORTING HER SUMMARY ON SPORTS WORLD IN FREELANCE GRAPHICS. THIS PRESENTATION WAS ROUTED AS A NOTES DOCUMENT SO OTHER INTERESTED PARTIES IN MARKETING, PRODUCT DEVELOPMENT AND EVEN OTHER SALESPeOPLE ON THE ROAD, LIKE DAVE, CAN QUICKLY ACCESS IT AT THEIR CONVENIENCE.

4 LUCY COMPLETES HER 1-2-3 EXPENSE REPORT FOR THE TRIP, WITH THE ESTIMATED EXPENSES AND THE CASH ADVANCE AMOUNT BEING AUTOMATICALLY ENTERED FROM AMI PRO TO 1-2-3 THROUGH THE NOTES/FX LINK. THE EXPENSE REPORT IS AUTOMATICALLY ROUTED TO HER MANAGER AND THEN TO FRED IN ACCOUNTING.

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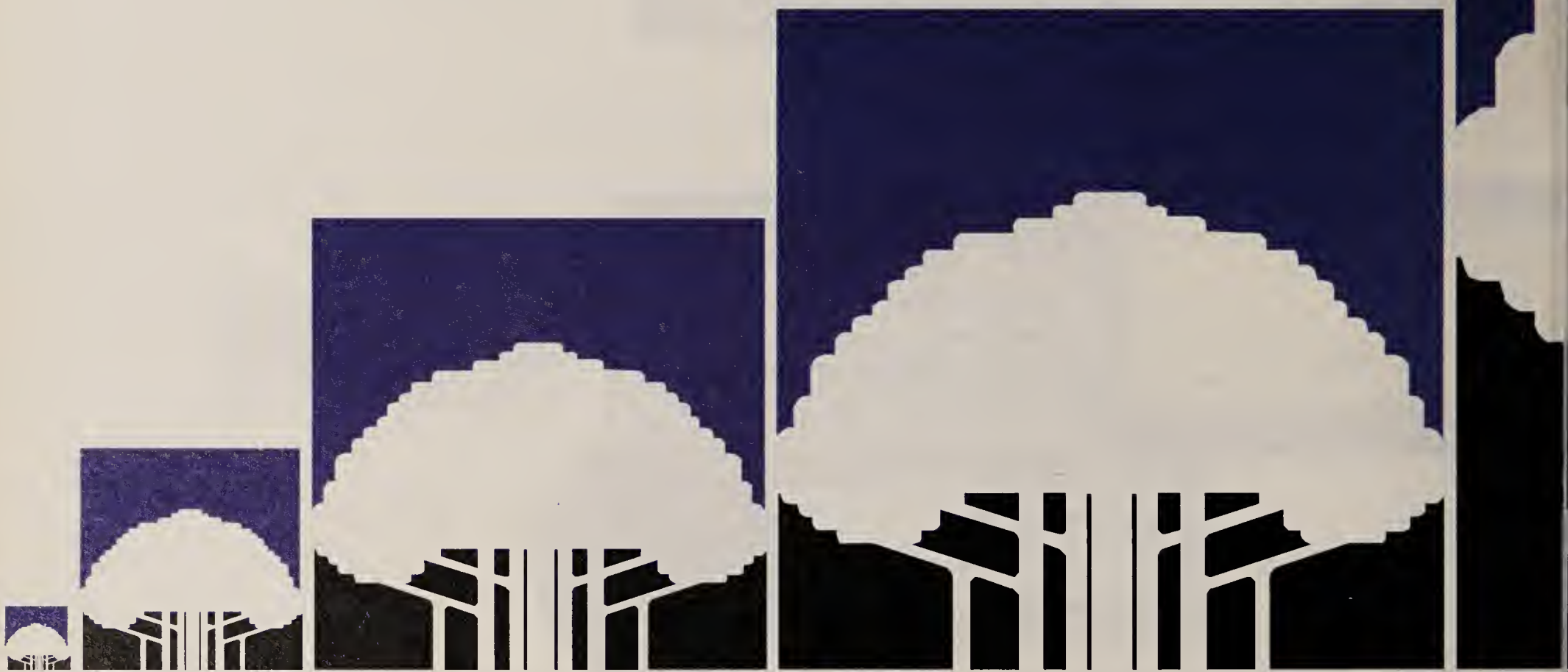
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Users say: NetWare gains worth the pains

Version 4.01 customers talk pros and cons

By Elisabeth Horwitt
BOSTON

Network administrators surfaced from the throes of commercial NetWare 4.01 deployment long enough to report that the advantages of using Novell, Inc.'s enterprise network operating system outweigh the compatibility problems, lingering glitches and functional gaps that still occasionally crop up.

Panelists at Networks Expo, held here earlier this month, described their experiences with NetWare 4.01. They said the NetWare Directory Service (NDS), with its global log-on capability, is a suitable vehicle for converting their companies from autonomous, isolated departments into an enterprisewide user community.

The upside

"You can log in from anywhere in the company — from home, from your desk, from an emergency station. It's phenomenal," said Chris Dumas, wide-area network coordinator at Commonwealth Edison Co. This is particularly important in an emergency situation when the Chicago-based utility needs to have experts from another department log on to a nuclear power station's system in a hurry, he added.

Air Canada is finding NDS invaluable when it comes to supporting a mobile work force that needs to access data on the corporate LANs, said John Shortall, senior consultant at the Montreal-based carrier. "We don't want to maintain user IDs in eight different administrative areas," he said.

Indeed, a major reason to jump onto NetWare 4.01 is the lower administrative costs that come with a single directory and log-on structure, said Bob Gill, vice president of networking computing at Gartner Group, Inc., which hosted the Networks Expo panel. Most LANs today, by re-

quiring administrators to manage user log-ons separately for each server and service, cost an average of \$5,000 per user per year, according to a recent Gartner Group study.

Panelists also praised Version 4.01's data compression and disk management features, which have resulted in a 50%-plus improvement in disk space use for Air Canada's initial NetWare 4.01 installation. Liberty Mutual Insurance Co. reported an average of 65% to 72% in compression savings.

Scalability is another major NetWare 4.01 plus, panelists reported. Indeed, Novell has somewhat stacked the deck against NetWare 3.12 in that regard, by discontinuing the 500-user license for the older system, Gill said. Novell told Commonwealth Edison that a thousand users on NetWare 3.12 would cost about 20 times the same number on Version 4.01, Dumas said.

The downside

However, NetWare 4.01 does have a downside. Problems still plaguing the system, according to panelists, include the following:

• **Occasional incompatibilities.** "You can't assume any given driver or NetWare Loadable Module works" with NetWare 4.01, Shortall said. Furthermore, Novell recently discovered

NetWare 4.01 user vital statistics

Liberty Mutual Insurance

- **NetWare installation:** 130-plus servers
- **Rollout:** 26 4.01 servers in progress
- **Biggest NetWare 4.01 headache:** Weak Mac support

Air Canada

- **NetWare installation:** 76 NetWare 3.11 servers
- **Rollout:** Two pilot NetWare 4.01 servers now; additional server upgrades in March
- **Biggest NetWare 4.01 headaches:** Unexpected driver, NLM incompatibilities, lack of support for key NLMs

Commonwealth Edison

- **NetWare installation:** 150 servers
- **Rollout:** One 4.01 server per site; first site converted to NDS in January
- **Biggest NetWare 4.01 headache:** Compatibility problems with drivers

Behind the times

About 95% of companies today are still using "old-style" LANs that provide basic hard disk and printer sharing at an average cost of \$5,000 per person per year, primarily for support, according to Gartner Group, Inc.

some bugs with combinations of certain products, he added. Panelists also reported that not all disk and network control card drivers included in the CD-ROM of NetWare 4.01 actually work with the system.

• **Third-party support** has been slow in coming.

• **Some key Novell services**, such as NetWare for SAA, NetWare Access Server and NetWare Connect, are not "NDS aware," Shortall said. This means that users who wish to access such services must do bindery emulation in order to get at them through a NetWare 3.11 server. Most printer cards are not recognized as NDS objects, Dumas said.

• **Macintosh support** for NetWare 4.01 is sparse to nonexistent. Liberty Mutual Insurance, a major Macintosh shop, currently "lives and dies by bindery emulation" because Macintoshes must log on to NetWare 3.11 servers to get at NetWare 4.01 resources, said Jeff Day, a manager of utility services at the firm. Novell is planning to enhance Macintosh support on 4.01 shortly.

• **Administration tools** for NDS are lacking, according to Day. "We want a graphical view of servers that stays green if things are OK and red if there are synchronization problems," he said. Also needed are "proactive management" tools that would, for example, report problems with a directory partition before users start calling in to report they cannot log on, he said.

What's next

Novell is expected to announce NDS administration tools, along with more direct NDS support for NetWare 3.11, with the release of NetWare 4.1 in the next month or two [CW, Feb. 14].

Better monitoring of NDS partitions is particularly crucial given two panelists' reports that partitions occasionally can vanish into thin air.

Messaging strategies

New E-mail LAN servers prove no threat to backbones

By Lynda Radosevich

A large corporation does not live by LAN alone, at least when it comes to electronic mail, some large customers recently said.

Despite major headway in LAN-based E-mail scalability and standards support, LAN servers alone will not be robust enough to sit in the middle of their enterprise messaging architectures, some large corporations said.

Instead, the firms said, they will continue to rely on a separate messaging "backbone" that is independent of the LAN systems. They need this backbone

to integrate the different messaging systems typically installed in large companies and to integrate their directory services.

For instance, Exxon Corp.'s messaging strategy is based on using Microsoft Corp.'s Enterprise Messaging Server (EMS) — which is in initial beta test sites — as a regional messaging server and SoftSwitch, Inc.'s Enterprise Message Exchange (EMX). Exxon is using EMX as a corporate backbone messaging switch and directory server, according to Durwin Sharp, the Houston-based company's E-mail adviser.

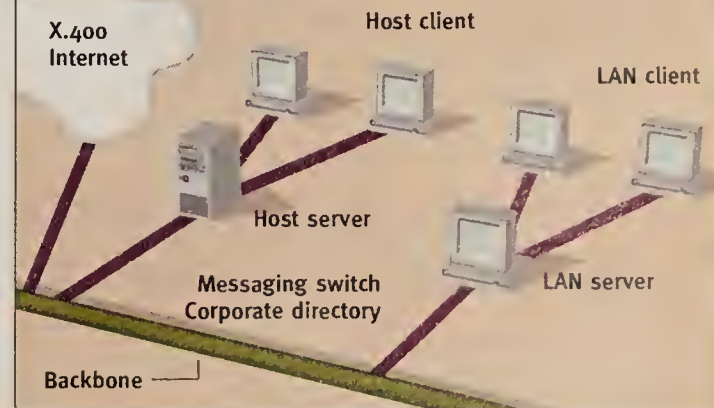
EMS alone will not suffice because its

multivendor routing capabilities are limited, and "we have legacy systems that we have to communicate with," including IBM's Distributed Office Support System and Wang Laboratories, Inc. systems, Sharp said.

Likewise, Texaco, Inc. is in the process of migrating from mainframe-based E-mail to a three-tiered architecture based on a next-generation LAN server. This, in turn, feeds into a backbone

A three-tiered model

Despite the emergence of robust, standards-based messaging servers, some large E-mail sites will still need a backbone layer for integration and stability



switch, according to Don Price, a technologist at the Tulsa, Okla., firm.

A messaging backbone translates messages and synchronizes directories among different E-mail systems. The E-mail, page 68

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Artisoft offers migration to NetWare client/server

By Elisabeth Horwitt

■ **Artisoft Corp. is working with Novell, Inc. to provide users with an upgrade path to client/server computing when their applications begin to outgrow Artisoft's LANtastic peer-to-peer networking software.**

Tucson, Ariz.-based Artisoft is building a dedicated server, based on Novell's NetWare 4.01, as well as a NetWare Loadable Module to enable LANtastic clients to access some NetWare 4.01 services.

However, Artisoft's dedicated server will not be NetWare-compatible and will lack some of the enterprise capabilities in Version 4.01, such as a global directory, Artisoft executives said. Furthermore, it will only support 10 to 100 clients.

No NetWare communication

The Artisoft server will use underlying NetWare 4.01 code — like the kernel of an operating system — but will have all kinds of proprietary features on top, such as Artisoft's own version of Novell's directory and easy setup. Therefore, it will not be able to talk to other NetWare servers.

The server will have NetWare's fault-tolerant features, such as disk duplexing and mirroring; and the 32-bit architecture will provide users with faster file and print services than LANtastic's existing DOS-based environment, said William Keiper, Artisoft's president and chief executive officer.

Artisoft's server will also offer a scaled-down version of Novell's NetWare Directory Service, which will be much easier for both users and administrators to deal with, said Sunil Padiyar, the company's vice president of engineering. Overall, Artisoft will make the server easy to use and administer, aiming it at its own customer base of small to medium-size businesses and remote sites that do not have their own on-site LAN administrator, he added.

Needed path to client/server

Despite the limitations, Keiper said Artisoft customers will still benefit. Customers need the "combination of peer-to-peer and client/server," Keiper said. "If we don't have such a product, those that are forced to move [to client/server] will be forced to leave us."

Ideasign Computers, a value-added reseller of both Novell and Artisoft products, has several customers in the above category, according to Sandy Silverberg, president of the Sioux Falls, S.D., firm. For example, when one client brought its custom development staff in-house, users began moving "huge databases across network cable," overtaxing the network and their PCs. For this customer, "client/server has become an alluring option." LANtastic's support of IPX and NetWare Core Protocol, promised in the next version, "will give them a migration path to NetWare."

Artisoft's dedicated server should also be a valuable offering for customers who

want more powerful support of shared applications, coupled with the kind of easy-to-use environment that Artisoft specializes in, Silverberg said. Artisoft currently allows users to dedicate one PC as a dedicated server, "which is far more secure than NetWare" because it is off-limits to anyone outside the group, he added.

The initial server is scheduled to ship by the end of June. Pricing information was not available. Future versions will support migration to a true NetWare 4.01 server at an undisclosed time.

In addition, an upcoming release of LANtastic will have a universal client that has multiple protocol stacks, including Novell's IPX and NetWare Core Pro-

tol, NetBEUI and Artisoft's proprietary version of NetBEUI, Padiyar said. This will enable the clients to simultaneously connect to NetWare, Microsoft Corp.'s Windows NT or LAN Manager and an IBM AS/400 host, he added. The protocols will use upper memory extensively to avoid RAM cram problems on DOS clients.

The new LANtastic client version is scheduled to ship in the next four to six weeks.

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E-mail

CONTINUED FROM PAGE 65

backbone does this via software "gateways."

The major LAN E-mail vendors are working on architectures that reduce the need for gateways because their servers will handle multivendor E-mail clients, similar to a mini backbone.

For instance, Lotus Development Corp., Microsoft Corp., WordPerfect Corp. and Novell, Inc. are in various stages of adopting client/server messaging models that allow their E-mail interfaces to communicate and to access each other's back-end transport and directory services without running through gateways [CW, Oct. 11, 1993].

Additionally, Lotus' forthcoming Lotus Communication Server (LCS) will include an optional X.400 message trans-

port, based on technology from Data Connection Ltd. in London. Microsoft's EMS also uses Data Connections' X.400 technology, so the servers should exchange messages without gateways, according to a Lotus spokesman [CW, Feb. 14].

"If you have a relatively simple environment, you could look at the implementations to talk directly together," said Dave Whitten, a program director at the Gartner Group, Inc. in Stamford, Conn. However, "I don't see EMS or LCS

in the next few years to be as valuable as backbone switching machines."

Instead of being used as enterprise-wide hubs, he said, LCS and EMS will likely be used to support only their own user mailboxes and to integrate only their own file- and client/server-based systems, he said.

For large sites, the LAN servers lack several components necessary to make them true enterprise servers. For one, their point-to-point gateways are not optimal for sending messages from, say, the Internet through the server to an X.400 system. That is because they do not have central naming rules that can take care of the multiple address changes needed in that case, according to Michael Zisman, president of messaging switch vendor SoftSwitch.

"EMS is a great next-generation LAN mail server, but it's different than a multiprotocol switch and backbone service because it is not meant to solve interconnection problems," Zisman said.

Also, the new servers will only scale to support thousands of users, not 100,000 as SoftSwitch's EMX does, he added.

In recognition of that point, Lotus and Microsoft are working closely with SoftSwitch to test their products' interoperability, directory synchronization and management features, the companies confirmed.

Likewise, Microsoft is working with X.400 backbone vendor WorldTalk Corp. to integrate that company's 400 messaging switch with EMS [CW, Feb. 14].



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Briefs

Kalpna registers patent

Kalpna, Inc. in Sunnyvale, Calif., received a patent for its switching technology that permits packets to be forwarded from one port to another with only a 40 microsecond delay via a process called on-the-fly switching.

Networking firms unite

Network Systems Corp. and **Essential Communications** recently announced a partnership to build and market gigabit speed networking products including High Performance Parallel Interface switches and Asynchronous Transfer Mode and Synchronous Optical Network gateways.

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New Products

Networks Expo products

Frye Computer Systems, Inc. has announced The Frye Utilities for Networks-NetWare Management Version 2.0, a network utility designed for troubleshooting and diagnostics that provides centralized administration and management of Novell, Inc. NetWare LANs.

According to the Boston company, the product enables network managers to update and edit critical NetWare functions and clone user configuration information across multiple servers, create new users or groups and create or edit trustee assignments.

Version 2.0 is available for \$495.

► **Frye Computer Systems**
(617) 451-5400

VisiSoft, Inc. and **Digital Communications Associates, Inc. (DCA)** have introduced VisiNet SNMP for RLN 2.0, a custom integration of VisiNet's Simple Network Management Protocol (SNMP) systems management software technology and DCA's remote LAN access product, Remote LAN Node (RLN) 2.0.

According to VisiSoft in Atlanta, VisiNet SNMP for RLN 2.0 offers management capabilities for corporate network management and allows network administrators to monitor multiple RLN servers on the corporate network and receive alert conditions regarding their status.

VisiNet for RLN 2.0 costs \$795.

► **VisiSoft**
(404) 320-0077

Cheyenne Software, Inc. has introduced the ARCsolo workgroup computing product family.

According to the Roslyn Heights, N.Y., company, ARCsolo provides storage management capabilities for workgroups and stand-alone PCs for DOS, Windows, OS/2 and Macintosh clients.

The products operate on peer-to-peer networks functioning independently of a server in small workgroup settings.

Support for most storage devices, host adapters and industry-standard drives is provided.

Features include a File Tracking System database that automatically maintains a record of all backed-up and archived directories and files, including their locations.

Pricing begins at \$195.

► **Cheyenne Software**
(516) 484-5110

NetManage, Inc. has introduced Chameleon32NFS, a TCP/IP for Windows NT application suite that includes support for Network File System clients and servers.

According to the Cupertino, Calif., company, the product was written to the Windows Sockets application programming interface and runs on the native NT TCP/IP stack.

The product provides TCP/IP applications for Telnet terminal emulation, Ping, Bind and NewsReader.

Chameleon32NFS costs \$695.

► **NetManage**
(408) 973-7171

Brightwork Development, Inc. has announced Brightwork Fusion, a software management package.

According to the Tinton Falls, N.J., company, the product integrates software tracking and control across a network and reduces support costs by providing network administrators with

systemwide software management, asset inventory and software distribution from a central workstation.

The product includes a scripting language that allows administrators to conduct update actions remotely and a library that recognizes more than 2,000 software titles.

The product costs \$1,499 for a 100-user server license.

► **Brightwork Development**
(908) 530-0440

Product short

Wingra Technologies has announced Jnet/AXP, a file transfer product that links IBM and Digital Equipment Corp. networks. Features include bidirectional file transfer, bidirectional remote printing, bidirectional electronic mail and bidirectional remote job submission. Cost: Ranges from \$3,000 to \$30,000. Wingra Technologies, Madison, Wis. (608) 238-4454.



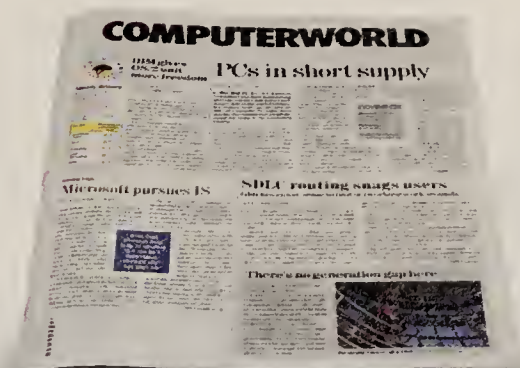
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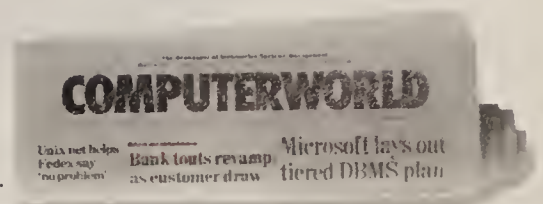


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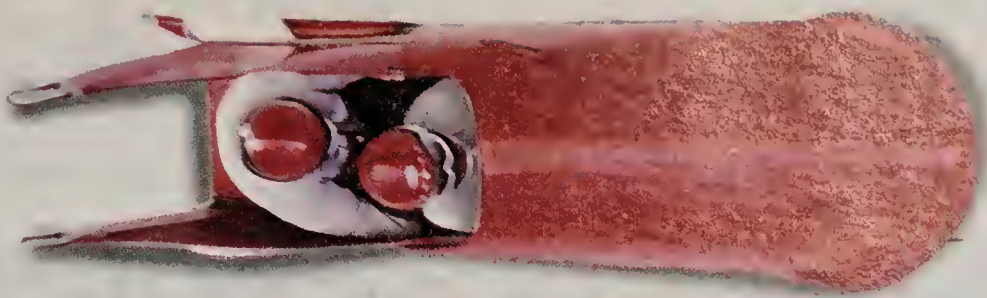
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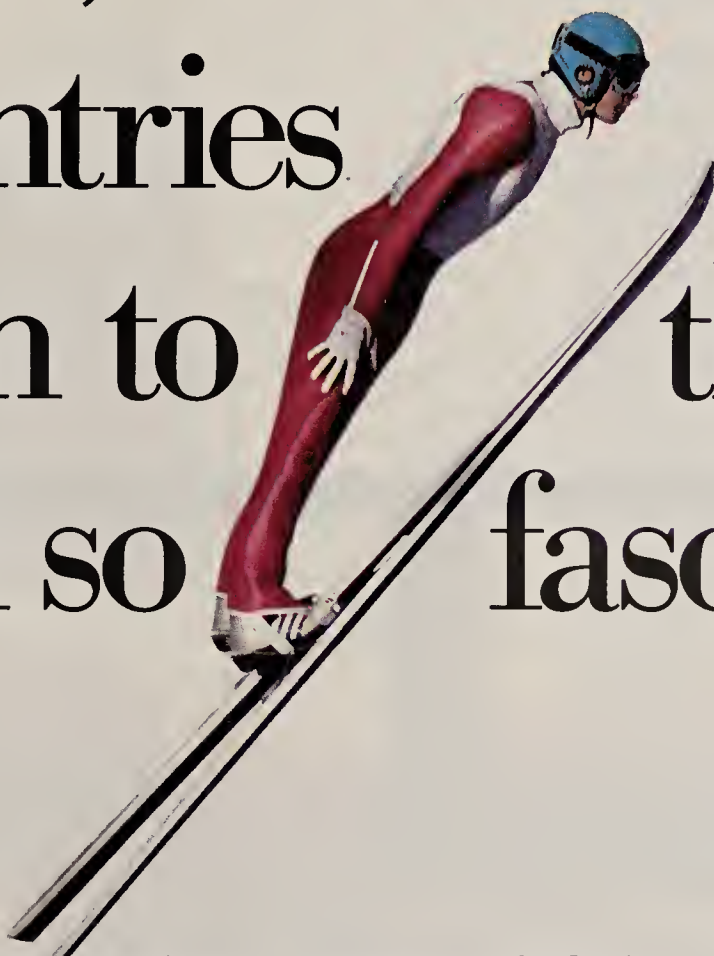
The Newspaper of IS

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athletes from over 60 far-
in 55 Olympic events—
detailed statistics





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Which is why the '94 Winter Games have mainframes "serving" the rest of their computer network "clients." It's the only way to handle the almost unimaginable information needs of this monumental event. Like, for example, making sure every local area network and PC

at Lillehammer—2,995 PCs, to be exact—has instant access to statistics, bios, results, timings, not to mention information concerning ticketing, maintenance, food, lodging and a host of other things.

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Data warehouse access in question

IS execs debate whether to give users access to production databases

By Craig Stedman
ORLANDO, FLA.

■ **Most companies looking at building data warehouses appear to have little interest in allowing decision-support queries to be made against their production databases. But the debate continues, with some users saying limited access to production data does not have to be ruled out.**

The predominant view at a recent conference here on data warehousing was that information from a company's operational systems needs to be cleaned up and put in separate informational databases before it can be safely depended on for decision-support purposes.

"We don't want our business analysts making strategic decisions off of operational data," said Robert Typanski, manager of emerging information systems technologies at Miles, Inc., a chemical and pharmaceutical manufacturer in Pittsburgh.

As Miles begins to implement distributed data warehouses in its various divisions, the IS department is "trying to get users to stop and think about whether their problem is an operational or an informational one and then to use

the right data," Typanski added.

John Sweeney, director of information management resources at Bank of Boston, said data that is going to be used for decision support has to be tidied up "so we don't have 13 different references to the same customer." Production databases may well contain "polluted data," he noted.

Some IS officials also worry that decision-support queries could bog down the performance of their production systems.

"If you take a risk on something that could affect your mission-critical applications, you could cripple the company," said

Dave Cannata, new technology project manager at Entex Information Services' data center in Canton, Mass.

"There are two different types of processing."

Risky access

Van Waters & Rogers, Inc., a Kirkland, Wash., chemical distributor, has given a small number of sales analysts access to operational data in the past. But Kevin Goyena, IS project manager,

WARE
data
HOUSE

Data warehouse defined

A data warehouse is a central repository of data that can be easily accessed and manipulated by end users from their PCs, primarily for use in decision support. It can take many forms, from an enterprisewide warehouse residing on a large server to a departmental database that is used by relatively few people. Necessary components include a data dictionary and tools for extracting information from production databases.

said the company plans "to minimize that as much as possible because we don't want to disrupt our on-line transactions."

Others, however, are more open to the idea of allowing some level of decision support off of the production data.

"The concept of keeping them completely separate was good a few years ago," said Thomas Tinsley, director of IS management at the state of Tennessee's Department of Finance and Administration in Nashville. But with the move toward client/server computing, production applications have become "more accessible and cleaner," Tinsley added.

Access for a few

Sally King, manager of data access services at US West NewVector Group, Inc., a cellular phone company in Bellevue, Wash., said the IS department there is letting "a handful" of marketing employees do queries against the DB2 and IMS databases that reside on its mainframes.

"I know this would give some people chills, but it's a very small number of users that we think we can control," King said. "Given the competitive nature of our business, we just felt that they were better off going against the real thing."

King said she hopes that opening up the mainframe databases to the marketing analysts will alleviate the pressure on IS to move more quickly than it deems prudent on a data warehouse that is now being implemented. "As soon as we gave them things on the data warehouse, they would want more data types that we hadn't given them," she said.

Commentary

Michael R. Ault

Two-phase commitment



The unfortunate side of asking for things is that we sometimes get what we ask for. Most relational databases now force two-phase commit on customers, regardless of whether it is the best method for accomplishing a multinode commit.

A two-phase commit is a database transaction that has a "prepare" phase and a "commit" phase. In the prepare phase, the controlling site queries all nodes as to their readiness. Once all sites report that they are prepared — meaning that the database and system are up and the data is in the buffers — the transaction is committed. If the commit point site fails, the entire transaction is rolled back. If any site isn't able to prepare, the entire transaction is rolled back.

Assume, for example, you have an application that uses a set of definitions that are centrally maintained

and then replicated out to several remote sites. You update the source table and then, using a database trigger, replicate the data. In most cases, it is not a make-or-break situation if the remote nodes aren't exactly in sync. An inconvenience, yes, but not really a big deal. However, if a two-phase commit is used, the entire update will fail if a single node is down or a single communication line fails.

That's OK if you want it to happen. But, if it's not what you want, it can be a problem.

Looking closely

What's more, some vendors use a hard-coded methodology to decide what node controls the commit (the commit point site) for each database. If, like most users, you pack several applications into a single database, this can result in the least significant node being the determination node for the entire two-phase commit transaction for a given application.

Given this situation, it's best to take a good hard look at your application transactions before converting to a database system that uses two-phase commit methodology. The transactions will fall into two general categories: those that must complete on all nodes and those that don't have to complete immediately.

There's no question that a two-phase commit should be used in the first instance. In cases where there are dependent transactions spread across multiple nodes — such as order fulfillment and inventory control systems — two-phase commits must be used to ensure data

concurrency. For situations such as the second one described, two-phase commits should not be used. This means you must figure out a way to defeat the vendor-imposed two-phase commit.

Bypass surgery

In most cases, using individual node commits will defeat the two-phase commit process. Insertion of forced, intermediate stage commits, with failure recovery code, allows the designer to bypass two-phase commit logic and allow for recovery from a failure situation. For now, the only method to defeat commit-point-site logic is by splitting applications with different commit-point requirements into differing databases.

Of course, the ultimate fix would be for database vendors to allow developers to place application commit-point strength indications in each application in a database.

Two-phase commits are great, if you can turn them off when they aren't needed. Database vendors need to acknowledge and make allowances for multinode transactions that don't require a two-phase commit. It's time to stop treating databases as monolithic units and consider the individual needs of component applications.

Ault is senior adviser for the global implementation team at Marion Merrell-Dow in Kansas City, Mo. His book, *Oracle 7 Administration and Management* from Wiley and Sons, will be published next month. He can be reached via CompuServe at 73564,544.

Outsourcing personnel pays off

By Ellis Booker

When John Schrober, manager of technical services at GE Capital in Stamford, Conn., moved himself and the company's data processing to Alpharetta, Ga., last year, he had a problem.

"I had to maintain some print facility to support the corporate functions in Stamford," he explained.

But rather than opting for the expense and remote-control management of six full-time operators working three shifts, five days a week in Stamford, Schrober elected to outsource the personnel responsible for maintaining the laser printers to Brandon Systems Corp. in Secaucus, N.J. Brandon provides the personnel and management for the center, and the result, Schrober figures, is an annual savings of around \$120,000.

Offering permanent help

While contract-programming firms have been providing short-term help to information systems shops for years, a handful of outfits that say they offer more than "temp" help have emerged.

These shops will, for instance, take over whole functional departments such as a help desk or a print center or offer customers service-level-based rather than flat-rate-based contracts. Both items make these firms seem more like outsourcers.

Thus, Alternative Resources Corp. in Lincolnshire, Ill., calls its most sophisticated staffing arrangement Smart Sourcing. Alternative Resources also provides true temporary help, which it calls "tactical" staffing, as well as "strategic," or long-term, staffing for projects taking nine months or longer.

Gary Rothman, director of marketing at the company, distinguishes Smart Sourcing from traditional outsourcing in that Alternative Resources never sets strategic goals for a project or promises a deliverable (such

as an application) at the end of the contract period.

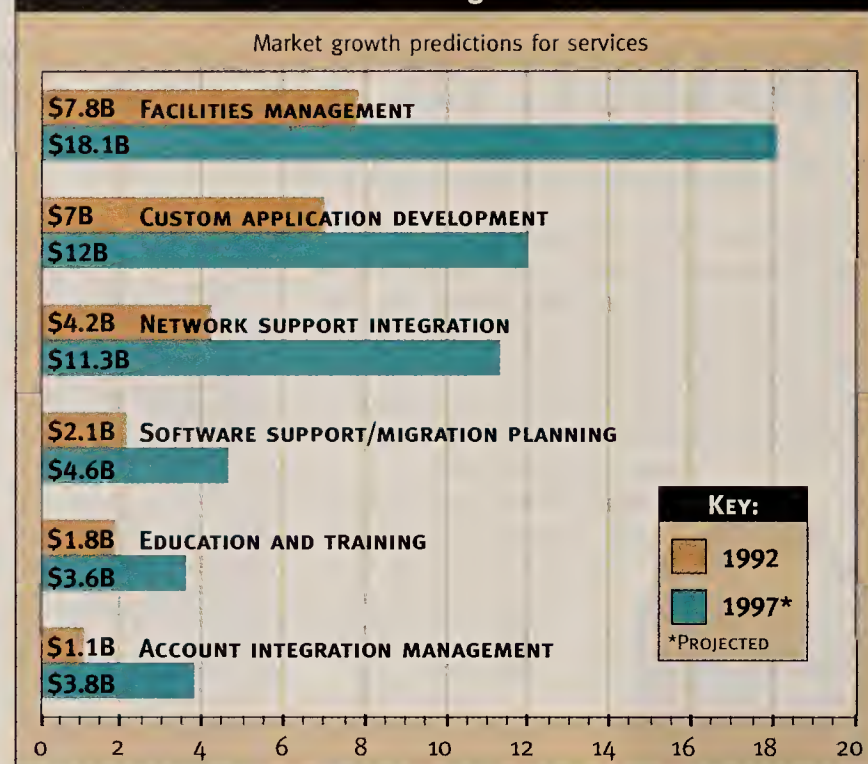
The privately held company was founded in 1988 and boasts a growth rate of more than 5,000%, making it one of the country's fastest growing firms. Alternative Resources revenue is believed to have topped \$50 million last year, according to *Inc.* magazine.

Taking care of training

Tom Janus, home office director at McDonald's Corp. in Oakbrook, Ill., has used Alternative Resources personnel in both his data center and his help desk.

Although Janus said he does not anticipate entirely outsourcing either function to the company, by mixing in its personnel he can "take care of legacy systems on mainframes while I train my people on new technology."

Outsourcing needs



Source: Dataquest, Inc., San Jose, Calif.

Another firm that offers more than temporary staffing but less than outsourcing is Brandon Systems, a \$56.7 million publicly traded firm.

Brandon, in fact, was born out of the merger of a contract programming and technical support services firm and a consultancy in 1982, when IMS Systems, Inc. (a subsidiary of System) acquired Brandon Consulting Group.

Like Alternative Resources, Brandon distinguishes its operational services from the strategic services offered by outsourcers. Brandon calls its approach "insourcing."

Not all are believers

But some analysts are not convinced the approach is all that new.

"I think this is marketing spin," says Julie Schwartz, director of professional services at Dataquest, Inc. Schwartz noted that it has been extremely difficult for temporary firms to "get into the boardrooms" and add more of a strategic rather than tactical value to their customers.

There can, in fact, be a thin line between the managed contracts offered by these IS staffing

firms and a true outsourcing relationship.

"When does this business turn into outsourcing?" asked George Logemann, director of management strategies at The Yankee Group in Boston. "I think it's when there's a large population of skills focused on one function over a long term."

For Schrober, a Brandon customer, the bottom line was economics.

"I didn't care if it took them 50 people or one person to handle the print center," he said, noting that he contracted for a level of service, not a particular number of bodies.

In fact, rather than the six employees Schrober thought would be required, Brandon has been able to run the center with just four people.

Greyhound outsources IS to get the best staffing talent

By Michael Fitzgerald

■ Greyhound Lines of Canada Ltd.'s recent decision to outsource its information systems function will help it deploy new technologies faster and branch into new areas of business, according to the bus company's top IS professional.

Greyhound, which outsourced to SHL Systemhouse, Inc., is also looking at moving certain functions away from its AS/400 setup to a client/server environment.

Mark Richardson, vice president of IS at Greyhound in Calgary, Alberta, said the company was trying to aggressively increase its use of technology, particularly as it expands its nonpassenger business. One area would be improving its tracking process for courier packages, Richardson said.

"We're streamlining processes.... We'll move more toward client/server,

and Systemhouse is good at that," he said.

Searching for staffers

Richardson said the company decided to outsource when it went looking to attract talent for an IS expansion.

Greyhound's location in Calgary had made it difficult to attract IS talent in the past, he said.

"We were really beefing up our IS staff, and we wanted to make sure we got the best people available," Richardson said.

Greyhound expects it will increase its 15-person IS staff by as much as 10 people, according to Richardson, and it believes the best place to find the level of talent it wants is to go "into the consultant's shop."

Richardson will stay on board to manage the outsourcing relationship, and Greyhound's director of development will also remain to manage core development efforts.

OUT
Sourcing

Briefs

More throughput from IBM

IBM's AS/400 division introduced, as expected, the high-end Model F97 quad processor, saying it provides 20% more throughput than the F95 quad machine released last year.

Fiat, CA enter agreement

Fiat SpA, the Italian automaker, has signed a seven-year, Europe-wide enterprise licensing agreement with Computer Associates International, Inc. The deal, based on Fiat's total processing power for IBM System/390 and Unix machines, includes the use of CA database management, business application and application development software throughout its European data centers through the year 2000. Financial terms were not disclosed.

Tandem builds support

Trying to expand beyond transaction processing, Tandem Computers, Inc. has launched a decision-support

marketing program built around its Himalaya parallel processors and NonStop SQL relational database. Tandem has also signed joint marketing deals with three vendors of data extraction software: Prism Solutions, Inc., Evolutionary Technologies, Inc. and Information Builders, Inc. Tandem said it is targeting 100G-byte or larger databases and is building support for the Open Database Connectivity (ODBC) specification into NonStop SQL. There are no plans to support other databases, officials said.

SCT gets Orlando utilities

SCT Utility Systems, Inc., a division of Malvern, Pa.-based Systems & Computer Technology Corp., has signed a \$1.1 million contract with the Orlando, Fla., utilities commission to provide its Banner Customer Information System for utilities software. Banner CIS, which provides billing, customer account management and related business functions, will support the utility commission's administration and management of 150,000 customers.

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New Products

Information Builders, Inc. has announced SmartMode for DB2, an intelligent query analyzer/governor designed to control information requests sent to IBM's DB2 databases.

According to the New York company, SmartMode addresses the problems associated with increased ad-hoc query loads from client/server applications.

The product was created to prevent runaway DB2 requests before any DB2 or system resources are used.

SmartMode is compatible with all ad-hoc query tools and client/server gateway tools that access DB2 through dynamic SQL.

Prices range from \$24,000 to \$49,500.

► **Information Builders**
(212) 736-4433

Prism Solutions, Inc. and **Tandem Computers** have introduced Release 3.5 of Prism's Warehouse Manager, an integrated decision-support product that offers scalability and performance benefits for constructing data warehouses on parallel processing platforms.

According to Prism in Sunnyvale, Calif., the software lets users integrate Tandem and non-Tandem source data into a target data warehouse using Tandem's NonStop SQL database management system and the NonStop Himalaya Range of parallel servers.

The product offers the ability to extract and integrate data, create and manage meta data, generate code and build a subject-oriented, historical base of information for decision support.

Pricing begins at \$95,000.

► **Prism Solutions**
(408) 481-0240

Kisco Information Systems has announced office automation tools for IBM's AS/400.

According to the Kisco, N.Y., company, the tools include word processing, diary/calendar management and electronic mail that can be used from any AS/400 terminal.

WordPower provides word processing functions that include text manipulation, edit and creation, spell check and mail merge. Event/400 is a diary/calendar management system. Omen, an E-mail system, can create and send basic documents among enrolled users.

Pricing for WordPower starts at \$395. Pricing for Event/400 and Omen starts at

\$295 each. OfficePower, which bundles all three packages, is priced from \$795.

► **Kisco Information Systems**
(914) 241-7233

BMC Software, Inc. has announced Application Restart Control, a product designed to increase data availability, improve integrity and save resources by automating and simplifying application restarts for DB2, IMS and sequential files.

According to the Houston company, the product automatically selects the correct checkpoint after an application or system failure.

The need for backout processing is eliminated because an application termination feature allows users to stop application processing at a checkpoint.

Prices start at \$13,500 for a perpetual license.

► **BMC Software**
(713) 918-8800

Product short

Best Power Technology, Inc. has announced its Patriot line of advanced power protection devices that provide backup for PCs, file servers, point-of-sale devices and fax machines. Features include battery runtime and lighted front-panel display. The series comes in 250VA and 400VA sizes. Cost: \$133 for the 250VA and \$219 for the 400VA. Best Power Technology, Necedah, Wis. (608) 565-7200.

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Mike Quintero



Don Black

code and as a result, easily enabled their existing applications to be moved to target environments.

But rather than just blow our own horn about the IEF for Client/Server, we asked Mike Quintero, Manager of the Development Center, Data

Administration and Design at Blue Cross and Blue Shield of Florida, and Don Black, Business Systems Consultant of Union Pacific to join in.

Mike: "We had all the hooks up in one week and it only took one more week to build the application and generate code. It was a snap."

Don: "I believe our success with this project is a tribute to the capability of the IEF and Texas Instruments in helping us quickly develop powerful building blocks and redeploy them as required to meet our evolving needs. TI supports everything you need for a major project and walks you through each step in a logical, integrated manner."

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They needed the ability to "right-size" the application to fit their business needs today, while also ensuring flexibility for future business needs.

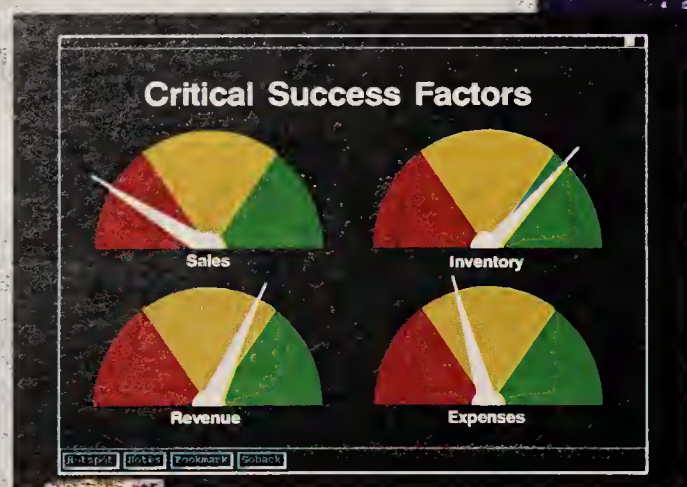
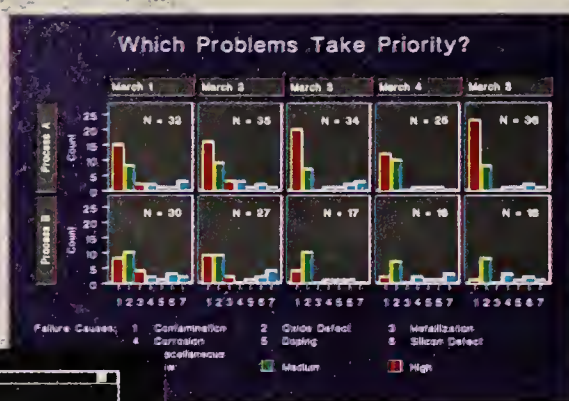
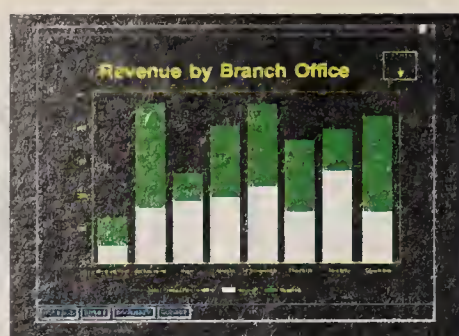
The IEF for Client/Server allowed them to concentrate on gathering information and developing business models without being distracted by technology concerns. They got the application they needed, when they needed it, and the added plus of some very happy end users.

Union Pacific Railroad developed a track inventory system to capture information about their track assets, such as where the track is located, what railroad owns it and who's responsible for maintaining it. They were looking for a solution that was compatible with existing systems and wanted support through their entire development process.

The IEF for Client/Server provided more GUI functionality for the Windows application, efficiencies through integration, modified and enhanced

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Carmaker takes client/server road

Toyota's EDI inventory system links parts suppliers, makes order-processing more predictable

By Kim S. Nash

After going client/server in one major car plant, Toyota Motor Manufacturing USA, Inc. wants to extend the concept to a second, brand-new factory starting next month.

Toyota's Camry division, based in Georgetown, Ky., late last year replaced a proprietary turnkey manufacturing system mandated by Toyota headquarters in Japan with a graphical one that for the first time links Camry's manufacturing side with its finance and administrative departments.

The move to a non-Japanese manufacturing system is unusual for a Japanese carmaker. Rival Mitsubishi Motors Corp., for example, uses an Asian-issued manufacturing setup, though that company — like Toyota — employs IBM mainframes for work in finance, administration and other areas.

"We're trying to make client/server a standard way of doing business rather than just an afterthought," said Roy Vasher, general manager of information systems at Camry.

What's the connection?

The \$500,000 just-in-time inventory system links 175 of Camry's biggest parts suppliers both here and overseas through an extensive electronic data interchange (EDI) network built with development tools from Gupta Corp.

The whole shebang is anchored with an IBM ES/9000 mainframe that feeds information to 486-based PS/2 Valuepoint PCs. Order processing is more predictable now, according to Vasher. Camry's Georgetown factory has been running the system since January and has seen marked improvements in getting the right parts to the right place.

For example, orders for parts, which go out

ON SITE

Toyota Motor Manufacturing USA, Inc.
Georgetown, Ky.

Challenge: To create a new manufacturing system that links two factories to each other and to administrative facilities.

Technology: Gupta SQLBase database and SQLWindows development tools; IBM PS/2 Valuepoint PCs; IBM ES/9000 mainframe running DB2 database.

Investment: \$500,000, including about \$100,000 in application development costs.

Results: Two-tiered client/server system that encompasses just-in-time inventory and an EDI network to 175 suppliers.

every hour, are now closely monitored to avoid overloading any single delivery truck. Moderate and even loads on each vehicle reduce transportation costs. Then, as trucks drop off parts on one of seven loading docks equipped with PS/2s, drivers pick up their next orders.

Toyota's decision to build a second U.S. plant gave managers a chance to reassess how business — and computing — was done, Vasher said. They knew they wanted to get the two plants communicating. That decision then pointed the 50-person IS team toward better networking with easier-to-use software, which is how Vasher defines client/server computing.

Camry's previous manufacturing setup lacked a graphical interface and was tough to navigate, Vasher said. Furthermore, a separate hardware/software setup was required at each location, which meant the two Camry facilities could not share information electronically. Also, the stand-alone manufacturing systems could not talk to Camry's ES/9000 on the business side of the house.

"No networking doesn't make for good or fast communication," said Vasher, who has led IS at Camry since late 1987, a few months before Camry's original assembly line started to roll in July 1988.

Decisions, decisions

One of the most difficult parts of the client/server undertaking at Camry was choosing which development tools to use. In May 1993, Camry called on database and application development firms Gupta, Powersoft Corp. and Sybase, Inc., companies Vasher considered "progressive."

Sybase sank when Camry had no luck getting a commitment regarding future development



Toyota's Roy Vasher: 'We're trying to make client/server a standard way of doing business'

products. At the time, Sybase did not have a unified line of tools, though it has since outlined plans to address all stages of software development by late this year.

Powersoft missed the cut because its flagship PowerBuilder tool lacks functions such as project management and a well-integrated back-end database, Vasher said. (Since then, Powersoft has bought Watcom Corp. to incorporate the Watcom relational database into the PowerBuilder developer's kit.)

Gupta's product breadth lets Camry deal with just one company for development tools, a key point of persuasion, Vasher said. Also helping the cause was Gupta's readiness to give Camry a full suite of products to experiment with before a decision was made, he added.

Using Gupta's SQLWindows, SQLBase and other tools, three Camry developers started work in August 1993 on a combination inventory tracking/EDI ordering system that models manufacturing rates and predicts how many

Carmaker, page 82

Wal-Mart picks Progress tools for greater flexibility

By Melinda-Carol Ballou

■ When you reach for a tape or video at your local Wal-Mart retail outlet next year, chances are it will be there thanks to distribution software now in development.

A Wal-Mart Stores, Inc. subsidiary, Western Merchandisers, Inc. in Amarillo, Texas, will next month deploy a new distribution system built using Progress Software Corp.'s Application Development Environment and the Progress relational database management system. This client/server system will replace host-based software created with IBM's RPG programming language and run on AS/400 platforms.

Called Breakthrough 1996, the application seeks to allow business managers to monitor inventory and speed delivery of products from Western Merchandisers' warehouses to Wal-Mart's video, music and book departments.

Distribution plans

The application will initially be rolled out on Novell, Inc. LANs running on Hewlett-Packard Co. servers at Wal-Mart's superstore in Mexico City. The developers will then recode the application to target the U.S. market. Distribution of the application to U.S. branches will begin in about a year, according to Randy Meredith, director of project management at Western Merchandisers. Full implementation is planned for 1996.

The company will continue to use some AS/400s as servers but will also replace part of its host-based environment with IBM RS/6000 Unix servers serving PC LAN clients. Developing with Progress offers greater portability and flexibility, Meredith said.

The RPG programs on the AS/400 "were so rigid," Meredith said. "Progress will give us greater flexibility and the ability to move to different platforms." One goal is to "get the processing closer to where the products are being distributed," he added.

Until now, Meredith's group had centralized its processing and "hit the max" on IBM's AS/400 every year, requiring "new [direct-access storage device] and new memory, which gets expensive," he said.

The new buying system will add data about new videos and CDs and distribute products to stores based on the demographics and buying patterns of the locations. The next step will be to create a replenishment system so that as products are scanned in and sold at the stores, Western Merchandisers will be notified automatically. This way new merchandise can be shipped to replenish inventory supplies.

"We've already been successful in creating the initial pilot program, and now we're getting ready to rewrite all of our software in Progress," Meredith said.

In addition to warehouses in Atlanta, Dallas, Denver and Reno, Nev., the company has a return and a recycling center. All those operations will be coordinated by the new software.



Western Merchandisers' Randy Meredith says Progress offers greater portability

IBM placates users with Windows migration tool

By Ed Scannell

Trying once more to win the hearts and minds of Windows developers, IBM has released a beta migration tool that converts 16-bit Windows applications to run natively as 32-bit applications under OS/2.

The Source Migration and Reporting Tool (SMART), developed by One Up Corp. in Dallas, comprises a suite of programs that can size virtually any conversion effort, including providing a count of the lines of code that need migrating. SMART can then provide developers and information systems departments with a road map for migration and automate code conversion.

The tool automatically converts between 40% and 70% of Windows source code and provides a report to assist developers with the rest of their migration efforts.

IBM sorely needs a conversion tool like SMART to be successful if it hopes to significantly broaden OS/2 2.1's market share on the desktop against Windows. The company attempted a similar effort a couple of years ago with Mirrors, a port-

ing tool developed by Micrografx, Inc., but it had little or no influence on leading Windows developers.

If IBM can persuade leading software developers to convert their popular Windows applications using SMART, it may stimulate sales of OS/2-compatible applications enough to attract some much-needed bundling deals with large hardware vendors.

Some think SMART is a good idea that is coming along a little late in the war.

"If they had this sort of tool a few years ago and gave it away to every Windows developer they could find, they could have generated some interest. It is hard for me to see a lot of [users] drooling over getting something like this now," said Mike Drips, an IS professional in Tampa, Fla.

Still, IBM and One Up officials said they believe the amount of money and time SMART can save in porting to OS/2 will win over a significant number of corporate IS accounts.

IBM will make the beta version of the tool available through its OS/2 Developer Connection CD-ROM, which is an annual subscription service.

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Briefs

Denmark toolmaker sold

KnowledgeWare, Inc. is extending its support for AS/400 environments with the acquisition of AS/400 software tools from IFM Systemer A/S, a company based in Denmark.

Bachman names exec

Bachman Information Systems, Inc. announced that Masood Zarrabian has been appointed vice president of development. Formerly vice president of technology and business development at Computervision Corp., Zarrabian will be responsible for Bachman's modeling, database design and re-engineering, application development and performance product development. He will report to Peter Boni, Bachman's president and chief executive officer.

IntelliCorp unveils tools

IntelliCorp, Inc. is set to announce a set of object-oriented analysis and design tools this week that support rapid application development and a focus on business modeling. The new product, Object Management Workbench, is a result of a collaboration between IntelliCorp and James Martin & Co.

Intersolv in the black

Intersolv, Inc. reported earnings of \$23 million for the its third fiscal quarter, up 15% from the same period last year, company officials said. For the nine-month period ended Jan. 31, however, revenue increased 1%, to \$1.5 million.

Softlab rolls out Maestro II

Softlab, Inc. announced a new release of its Maestro II maintenance and redevelopment tools. The release includes interfaces to third-party tools and a new browser to more easily find required legacy components. With Maestro, users now have access to Micro Focus, Inc.'s Cobol Workbench and Applied Business Technology Corp.'s Project Workbench.

TI workstation to run on Sun

Texas Instruments, Inc.'s Information Engineering Facility (IEF) client/server Encyclopedia and the IEF Development workstation will now run on Sun Microsystems, Inc.'s SPARC/Solaris platform. Operating systems already supported by the TI product include: IBM's OS/2, Hewlett-Packard Co.'s HP/UX and Digital Equipment Corp.'s VMS.

Monash book gathers info

Monash Information Services, a consulting group in New York, announced the publication of *The Monash Guide to New Era Application Development Tools*. This 400-page book provides detailed information gathered from interviews over the course of three years with 30 major tool users and 14 vendors, according to author Curt Monash. It includes comparative analyses of products by most major vendors, including The ASK Group, Inc., Cognos Corp., Easel Corp., Gupta Corp., Inference Corp., Informix Corp., Intersolv, Inc., LBMS Inc., Oracle Corp., Powersoft Corp., Texas Instruments, Inc. and Trinzic Corp.

Carmaker takes client/server road

CONTINUED FROM PAGE 81

parts and which ones will be needed during the assembly process. In December, they finished an initial inventory system.

About \$500,000 went into the new system, including hardware, development tools and labor. Using Toyota headquarters' proprietary system would have cost double that, Vasher estimated. Actual development time cost the company \$100,000, including time to train end users in the new graphical system, he estimated.

Four months to design and create a companywide inventory system was "pretty impressive," Vasher said. So much so that Camry has standardized on Gupta tools for all future development.

Camry's decision to use a two-tiered, mainframe-to-PC infrastructure stems from a quest to minimize the layers of technology at the division, Vasher said.

He said he did not want to insert a Unix system between the mainframe and PCs because doing so would add complexity. Plus, Camry's 50-member IS department had no Unix experience but was well-versed in OS/2.

Toyota's Camry division has added eight people to its IS staff in the past year, bringing the department to 50 workers.

Other benefits

In planning for the second plant, Camry has identified several areas for improvement, such as physical car design and engineering and communication among all aspects of the business. Serious business process re-engineering, including creating a workflow system, is in

the works for the engineering department, Vasher said.

Currently a paper and "Sneakernet" process, car design is going all-electronic. Mechanicals and specification changes will be tracked by an identification number matched to an automobile's make and model. Developers are building the system with Gupta tools.



Compaq DeskPro
with IBM 15P (Left)

NEC Powermate
with IBM 14V (Top)

AST PowerPremium
with IBM 14P (Right)

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New Products

VisionSource Software, Inc. has announced Checkpoint/Restart for KnowledgeWare, Inc.'s Application Development Workbench (ADW) users.

According to the Marietta, Ga., company, the product offers users the ability to remember what trail their analysis took through the ADW tool set when an inter-

ruption occurs. It subsequently reopens the correct encyclopedias and diagramming tools to restart the analytical process.

Checkpoint/Restart includes completely integrated support for the ADW 2.07.x releases of design, planning, analysis, rapid application development and documentation workstation products.

Checkpoint/Restart is available for an introductory price of \$495 until April 15. After April 15, it will cost \$695.

► **VisionSource Software**
(404) 643-9464

Fulcrum Technologies, Inc. has announced that Fulcrum SearchTools, its suite of SQL-based tools, is available for C developers on the Macintosh platform.

According to the Ottawa company, the tools feature an application programming interface and a client/server architecture.

Users can build text-retrieval applica-

tions with the SQL language for all their strategic platforms, including Windows, Macintosh, Unix and OS/2.

The product provides code that is portable from one platform to another, lowering the cost of development.

Fulcrum SearchTools development kits start at \$7,500.

► **Fulcrum Technologies**
(613) 238-1761

PaperLess Corp. has introduced Version 1.2 of its PaperLess Filer Document Imaging Toolkit software package.

According to the Richardson, Texas, company, the product allows developers and end users to add document imaging capabilities to their MS-DOS application programs.

Version 1.2 does not require Windows, and it can be used to add imaging capabilities to application programs developed in dBase, FoxPro, Clipper, C, C++, Cobol, Basic and other languages.

Modules that can scan, compress, decompress, display and print document images are included.

The PaperLess Filer Document Imaging software package costs \$995.

► **PaperLess**
(214) 235-4008

HEM Data Corp. has introduced Snap-Master, data acquisition and analysis software for Windows.

According to the Southfield, Mich., company, Snap-Master, without programming, combines advanced data acquisition and storage capabilities with time and frequency domain analysis and near real-time plotting.

Features include Dynamic Data Exchange support, zooming and panning for large data files, multiple cursors, event markers, context-sensitive on-line help and the ability to concurrently acquire data from multiple sources such as low- and high-speed analog and digital cards, counter/timer cards and RS-232 inputs.

Standard modules without required programming start at \$495. A complete acquisition and analysis package costs \$1,985.

► **HEM Data**
(313) 559-5607

Ampersand Corp. has expanded platform support for its Matrix CICS-compatible transaction processing environment.

According to the Glendale, Calif., company, Matrix is available as a Windows 3.1 client to a Microsoft Corp. Windows NT Advanced Server.

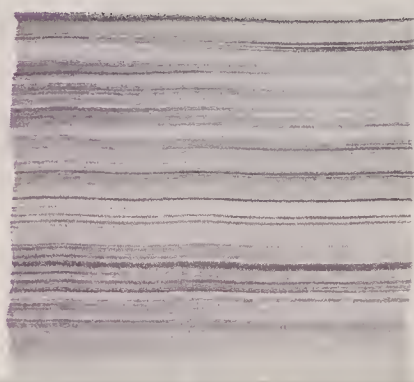
A suite of tools designed to simplify and accelerate application development productivity is included.

Users can set up CICS tables, resources and data sets and import and export tables with a Menu Manager.

Prices range from \$9,000 for an eight-user license to \$170,000 for a license for more than 512 users. Client/server license fees range from \$5,000 to \$8,000 for a server license and \$700 to \$1,200 for individual client licenses.

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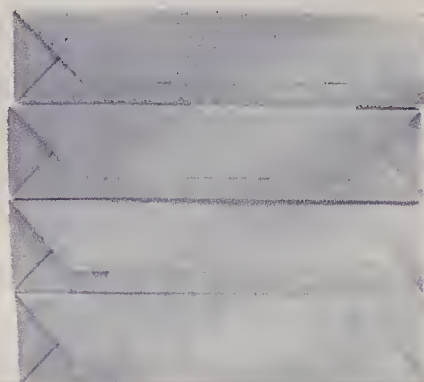
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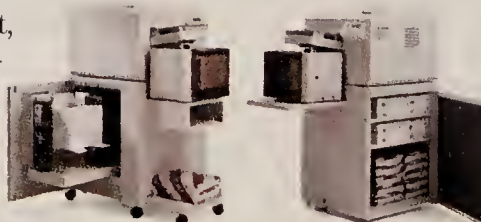
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If successful re-engineering
is to remain on target, COOs
and CIOs must aim for a
fruitful relationship together.
But too often, the two are
merely caught in each other's

CROSSFIRE

The age of re-engineering and the current focus on using information technology to improve business processes has revealed one of the political fault lines in today's corporations: the relationship between chief information officers and chief operating officers.

"Re-engineering cannot be driven by IS," explains Michael Hammer, president of Michael Hammer and Co. in Boston. "It must be driven by top management.

BY MELANIE MENAGH

And since the chief executive officer is occupied with external matters, it's the COO's job to provide the leadership and the environment for IS to work."

But in many companies, the relationship between COOs and CIOs may be anything from nonexistent to cursory to outright hostile.

Surprisingly, COOs often leave CIOs out of the equation when companies re-engineer.

"Many COOs underestimate the role of IS in devis-

Crossfire, page 90

WHY THE DISCONNECTION?

In order to forge more fruitful relationships, COOs and CIOs must overcome some fundamentally opposite approaches to their roles

COOs

- ▶ Short-term oriented
- ▶ Fear having technology forced upon them
- ▶ Fear encroachment by IS into their territory
- ▶ Underestimate strategic role of IS

CIOs

- ▶ Long-term oriented
- ▶ Must introduce new technologies
- ▶ Fear involvement by COOs threatens their job
- ▶ Must adopt business-oriented strategies



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Crossfire

CONTINUED FROM PAGE 87

ing new strategies," says Chuck Gibson, vice chairman at CSC Index, Inc. in Boston. "The CIO has not even been at the table in middle-level discussions. A working relationship between the COO and CIO is essential for any re-engineering to succeed."

"COOs who ignore their CIOs fall into traps, embarking on unrealistic and unachievable plans, making inappropriate or even disastrous technology choices," Hammer says.

Clearly, the changing nature of business, technology and global competition in the 1990s is turning the COO/CIO connection into one of the more important relationships in corporate life.

So why the disconnect between CIOs and COOs?

Much of the trouble arises from the changing nature and responsibilities of these two jobs.

Future vision

Timothy Edwards, COO at Matewan National Bank in Matewan, W.Va., says he has a dual role. "The COO is part visionary and part manager. The COO must take the CEO's vision and translate it into operations, to make that vision concrete by determining what buttons we need to push, what systems we need to incorporate to make the vision work practically."

That's especially true with manufacturers, says Peter Caserta, president and COO at Spectrum Information Technologies in Manhasset, N.Y. "According to the old methodology, the COO could increase efficiency in manufacturing by putting in one and getting out 10. Today the possibilities have skyrocketed with the advances in IS. You can put in one and get an increase in efficiency of 1,000."

In the 1990s, at the same time CIOs are being called upon to deploy information technology to improve business processes, COOs find they need more technical savvy to turn the CEO's vision into reality. This crossover into each other's territory has created tensions on both sides.

"Initially CIOs were excited that IS was going to be integrated into every aspect of corporate operations, and the COO was finally taking an interest in the technical side," says Alan Merten, dean at Johnson Graduate School of Management at Cornell University in Ithaca, N.Y. "Then CIOs felt threatened, [saying], 'Wait a minute, this guy is going to take away my job.'"

This creates a descending spiral of mistrust and fear, says Ron Brzezinski, principal at Transformation Associates in Wilmette, Ill.

"There is a perception that the CIO's function might not be required. And that perception is generated by the less-than-fruitful relationship they've been having with the COO. Avoidance of one another becomes the default position," Brzezinski says.

Insecurity and resentment — further aggravated by the mystery and mystique of the technology — also exists in the COO's corner.

With change coming at them from every corner, COOs depend on the CIO to work with them to decide from thousands of options how to maximize productivity and customer service. You have to get it and understand it early in the game if you want to stay ahead of the competition.

"Some COOs feel like they're

"Operations and IS must be looking at the total picture together as a team. Turf battles are nonproductive. There's no time for internal conflict; it'll drag the whole organization down and kill you in today's market."

**TIMOTHY EDWARDS (BELOW)
CHIEF OPERATING OFFICER
MATEWAN NATIONAL BANK**



"Time and again, you hear complaints from line managers that IS is not effective in operations. If the two functions can't be coordinated, systems will become localized, isolated and unintegratable."

**CHUCK GIBSON
VICE CHAIRMAN
CSC INDEX**

having technology forced on them," Edwards says. "This has placed them in a defensive position. They see that they have to share some IS responsibilities and want to keep IS from encroaching on their own territory."

"Confronted with the unknown, COOs feel ignorant and intimidated, and that has contributed to the adversarial mode," Edwards says.

The result? Antagonism and turf battles.

"The CIO must be the COO's early warning system," Merten says. "They need to see trouble coming. Otherwise, instead of a \$100,000 mistake that takes a few months to straighten out, you've got a \$4 million-a-year problem."

Another flash point is the con-

flicting time frame traditionally associated with each job.

"COOs were involved in short-term results," Brzezinski says. "CIOs were supposed to project what systems would be most effective over the long term."

COOs tend to define their jobs as caretaker of day-to-day operations. For example, John Snyder Jr., IS manager and former COO at Brenthorn Mutual Insurance in Hagerstown, Md., says the COO's job is to "coordinate management, supervising the day-to-day processing of services and/or product through the company."

Once, the COO could think about the day-to-day and the CIO could muse about the future, and never the twain did meet. But as technology advances and competition tightens, reconciling these time frames has become imperative.

"The call for technology and business processes that transcend regional lines into international markets suddenly requires the COO to consider long-term strategies," Gibson says. "That's diametrically opposed to the constant pressure for short-term growth and profitability. The relationship between CIO and COO will pass or fail depending on how they resolve this conflict."

All this provides ample room for misunderstanding and mistrust. Problems can occur even in the best relationships.

Smoother sailing

But the relationship need not be rocky. Matewan National Bank, a moderate-size regional institution, was looking for ways to streamline operations. "We wanted to adjust the ways we do business to respond faster to customer needs and the marketplace. We were considering several options — modifying the existing system, getting a larger system, outsourcing," Edwards says.

The CIO played a crucial role in these deliberations.

"I knew what I wanted to happen, but I only had a layman's education relative to networking and systems," Edwards says. "The CIO took the general map of my ideas, then fleshed out the streets and addresses. Without the CIO we'd be shooting in the dark."

The pooh-bahs are universal in their dire predictions of disaster if the COO and CIO fail to connect.

"Technology is not a curiosity anymore," Marlow says. "It's a major technical advantage. COOs who realize this and work with their CIOs are going to run away from the competition. Those who don't — it's not a question of coming in second — are not going to survive."

Menagh is a free-lance writer in New York.

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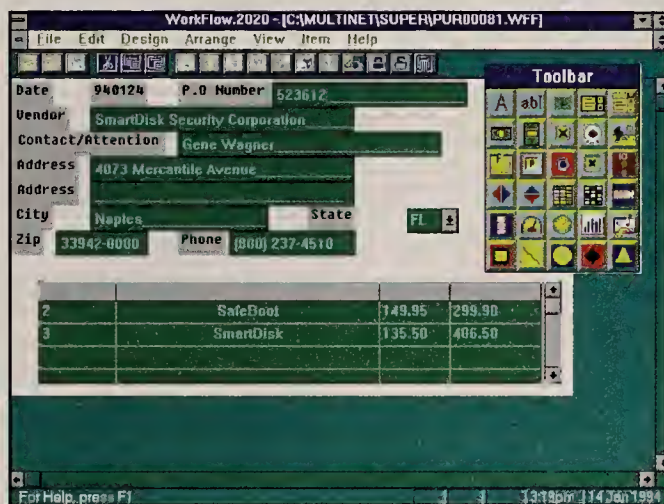
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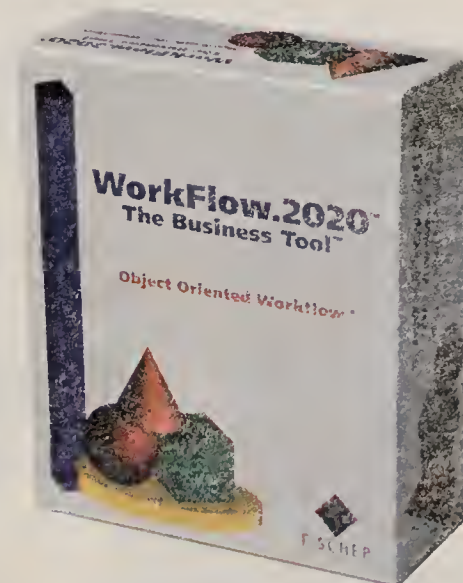
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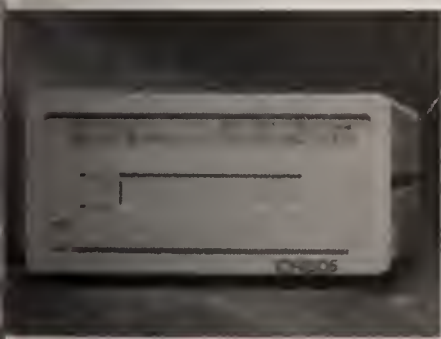
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SOURCE: ROBERT W. HALL, DIRECTOR OF NEW PROGRAMS AT THE ASSOCIATION FOR MANUFACTURING EXCELLENCE

By Alan R. Earls

Sharon LeGault recalls the momentary feeling of "celebrity" she had as a speaker at the recent Association for Manufacturing Excellence (AME) conference. When she finished her talk on building a virtual company, in part through applying information systems-based tools, LeGault says, "100 people rushed the stage."

What had piqued their interest was DataBeam, a conferencing tool from DataBeam Corp. in Lexington, Ky., that can be used over standard telephone lines. LeGault had just described how her firm, Seitz Corp. in Torrington, Conn., used DataBeam to develop, design and manufacture interactively with its customers and suppliers.

DataBeam helped link computer-aided design (CAD) resources and people across a wide geographic area. "Everyone wanted to know about it," she says.

LeGault's experience is probably typical of those currently experimenting with the concepts of agile manufacturing, the virtual company and networked manufacturing. The more people hear, the more they want to know.

To explain the power of agility, Steven L. Goldman, technical director of the Agile Manufacturing Enterprise Forum at the Iacocca Institute at Lehigh University in Bethlehem, Pa., draws on the analogy of the hospital emergency room.

Composed of a wide array of equipment and staffed by several kinds of specialists, emergency rooms are organized to deal on short notice with anything from a splinter to a heart attack. Agile organizations, he argues, will be able to quickly adapt to demand using similar strategies. For example, an agile manufacturer can quickly produce variations of the same product to meet the demands of individual customers or switch swiftly

from one product to another to meet shifting market conditions.

Many associations, professional organizations and educational institutions are responding to this new need with a wide range of programs.

According to Robert W. Hall, director of new programs at the AME, definitions of agility, virtual companies and networked manufacturing flow from one another. The virtual company idea, he notes, had its origin in a book published by Charles Savage in 1992. The idea was built on established "critical path" thinking from project management but adds in powerful communication tools to permit people and resources to be added or removed more readily.

Virtual companies (sometimes called networked manufacturing within manufacturing circles) flow from the idea of companies sticking to the things that allow them to add the most value — and cooperating with other companies to do the rest. At the heart of the virtual company concept, Hall adds, is the idea of concurrence in design and manufacturing, aided by telecommunications. And the idea is taking hold, propelled in part by a host of new organizations or groups within existing organizations.

In Goldman's view, agility, networked manufacturing and the virtual corporation evolved from the ideas of the 1980s, especially "lean" manufacturing. It was lean manufacturing that began the process of "cannibalizing and subverting" mass production by showing that volume wasn't the only way to make money; firms could be profitable by eliminating unnecessary processes, cutting time to market and focusing on the needs of individual customers.

"This is about how we are organized and how we think," Goldman says.

Filling the knowledge gaps

Thus, the focus of the Agility Forum — its "short" name — has been on providing information and training to all levels, from the shop floor to the executive suite. The center has opened itself to the needs of service industry firms, with comparable organizational needs, and has also kept its basic service free, Goldman says.

One of the forum's tools is the ability to share information electronically. Thus, it operates Agile Net, accessible through the Internet, to provide information to a broad audience.

On a more nuts-and-bolts level, the Manufacturing Application and Education Center (MAEC) operates its "teaching factories" connected by the Internet and its own Integrated Services Digital Network.

"Communication is the key when you talk about agile manufacturing or the virtual company," says Stephen Ricketts, vice president for research at the National Center for Manufacturing Science in

Ann Arbor, Mich., which runs the MAEC.

Ricketts says the MAEC teaching factories — a resource shared geographically or within an industry segment — can help smaller companies try technology with little risk. These facilities are derived from Japanese organizations called kohsetsushi, which have helped disseminate new techniques there.

At the Mid-Level Technology Center, sponsored by the National Institute of Standards and Technology at Colorado State University at Fort Collins, Philip F. Gold wears two hats. As a field engineer at the center, he helps clients with training and consulting issues. Gold also bus-

ies himself as head of the IEEE Industrial Electronics section, which focuses on information sharing regarding the many enabling technologies needed to implement new manufacturing strategies.

Len Allgaier, manager of external technology initiatives at General Motors Corp., warns implementors to be careful.

"There is a difference between information and knowledge. Cultural change needs to accompany the smart deployment of tools," he says. "If we are just pushing information at each other, these things will just be toys."

Earls is a free-lance writer in Arlington, Mass.

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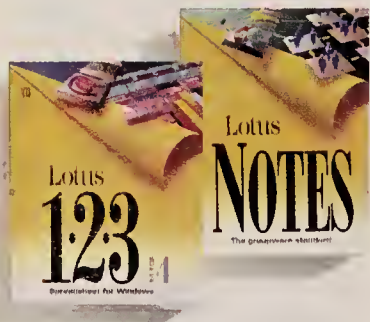
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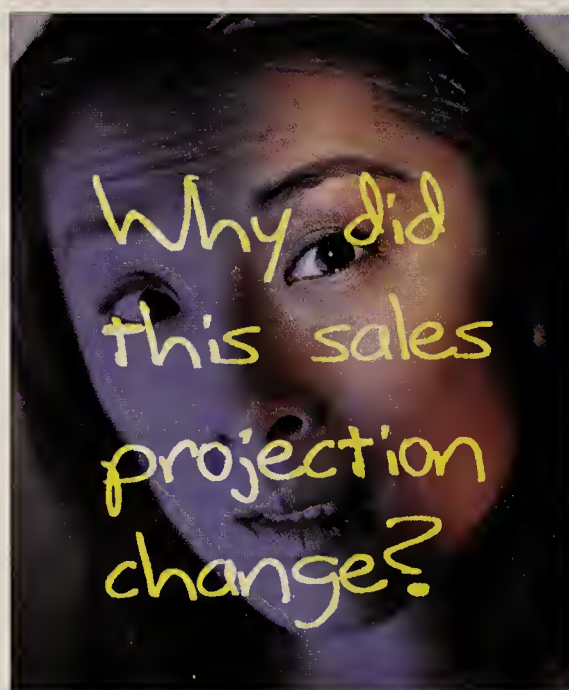
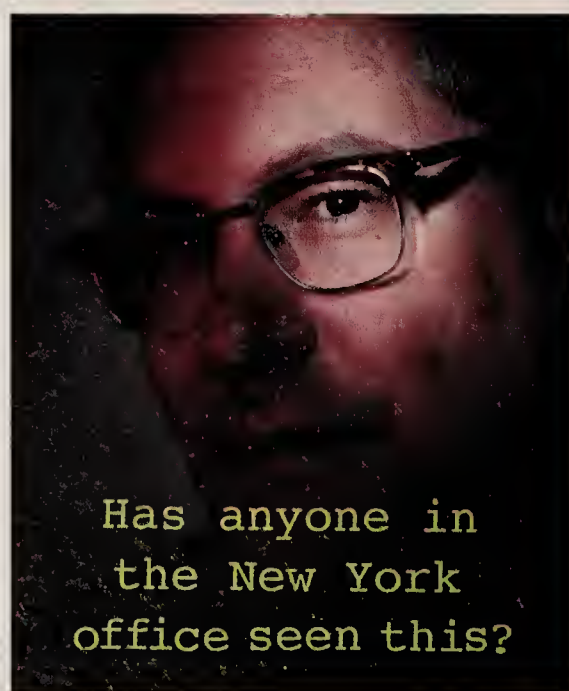
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Calendar

MARCH 6-12

Automatic Data Processing (ADP) Industry Conference. Tucson, Ariz., March 7-10 — Contact: ADP, San Ramon, Calif. (510) 866-1100.

Mobile '94: A Technologic Conference & Exposition. San Jose, Calif., March 7-10 — Focus: mobile technology. Contact: Rob Johnson, Technologic Partners, New York, N.Y. (212) 696-9330.

The Fourth Annual PBXs in the '90s: Technology Trends, Strategic Applications and Market Directions. Washington, March 7-10 — Contact: Business Communications Review, Hinsdale, Ill. (800) 227-1234.

Daratech CAD/CAM, CAE Strategy Workshops. Cambridge, Mass., March 8-9 — Contact: Daratech, Inc., Cambridge, Mass. (617) 354-2339.

Computer '94 Telephony Conference & Exposition. Dallas, March 8-10 — Contact: Jim McManus, Telecom Library, Southampton, Pa. (215) 355-2886.

Re-engineering: The Implementation Perspective. San Francisco, March 8-10 — An educational seminar that will provide an introduction to both the concepts and the objectives of re-engineering, along with an analysis of the business factors that drive it. The instructor will be Michael Hammer of The Center for Re-engineering Leadership, Cambridge, Mass. Contact: Hammer and Co., Cambridge, Mass. (617) 354-5555.

The Agile Manufacturing Enterprise Forum. Austin, Texas, March 8-10 — Theme is "Exploring Ways Agile Competition and Virtual Companies Impact Your Company's Bottom Line." Contact: Agility Forum, Bethlehem, Pa. (215) 758-5516.

MARCH 13-19

The BancA 5th Annual Executive Conference. Dallas, March 13-15 — Contact: BancA, Dallas, Texas (214) 788-0018.

1994 International Integrated Manufacturing Show & Conference. New York, March 14-17 — Contact: Manufacturing Execution Systems Association, Pittsburgh, Pa. (412) 781-9511.

Software Development Conference & Exposition. San Jose, Calif., March 14-18 — Contact: Software Development Business Software Solutions, San Francisco, Calif. (415) 905-8120.

Re-engineering: The Implementation Perspective. Boston, March 15-17 — Instructor will be Michael Hammer. Contact: Hammer and Co., Cambridge, Mass. (617) 354-5555.

PC Marketplace '94. San Francisco, March 17-18 — Contact: Lara Halbert, CMC, Norwalk, Conn. (203) 852-0500.

Planning and Implementing Self-Directed Work Teams. Phoenix, March 17-18 — Contact: Association for Manufacturing Excellence, Wheeling, Ill. (708) 520-0163.

MARCH 20-26

Shaping the Future of Corporate Finance. Palm Springs, Calif., March 20-22. — Contact: American Financial Association, Boston, Mass. (617) 345-9700, Ext. 118.

1994 Platforms for Communication Forum. Phoenix, March 20-23 — Focus: Design of on-line videoconferencing salons, the role of traditional entertainment companies in the new world of "convergence" and the impact of government agencies and policies. Contact: Daphne Kis, EDventure Holdings, Inc., New York, N.Y. (212) 924-8800.

"Focus on Operations." Atlanta, Ga., March 20-24 — Keynote speaker will be Larry Csonka. Contact: AFCOM, Orange, Calif. (714) 997-7966.

NAB Multimedia World. Las Vegas, March 20-24 — Contact: Andy Peluso, NAB '94 News Media Registration, Washington (202) 429-5350.

FOSE '94. America's Information Technology Forum. Washington, March 21-24 — Contact: Rosanne Desmone, National Trade Productions, Inc., Alexandria, Va., (703) 683-8500.

Uniforum '94. San Francisco, March 21-25 — Contact: IDG World Expo, Framingham, Mass. (508) 879-6700.

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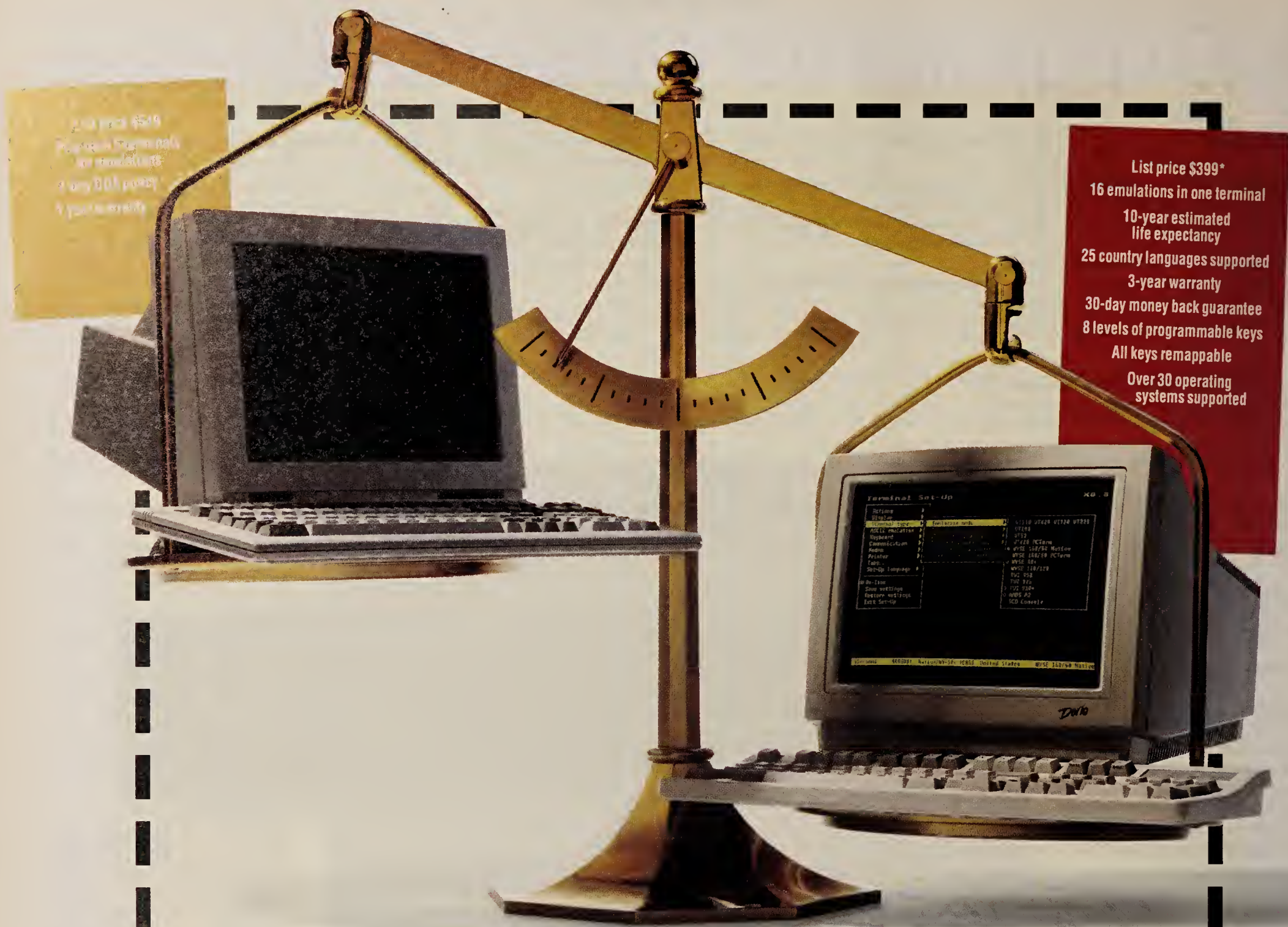
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The CW Guide to Workflow

Workflow changes its image

BY THOMAS M. KOULOPOULOS

There's a lot of change to track in today's embryonic workflow market. This technology has traditionally revolved around big production imaging applications, such as insurance claims processing, with costs running as high as \$20,000 per seat. At least a third of that is in integration and programming services.

Workflow will continue to play a strong role in these transaction-based applications. But a "new workflow" is on the horizon.

This new workflow purports to join the people, information, applications and rules that govern business processes throughout the enterprise, from routine office work to short-term projects to line-of-business applications. It is an environment for coordinating existing solutions, not competing as yet another application.

The new workflow is typified by workgroup applications development, heavy user involvement and a cost of entry that is less than \$2,000 per seat. Workgroups see it as a means of bridging the

**NO LONGER JUST
A SUBSET OF
IMAGING,
WORKFLOW
IS HELPING
ORGANIZATIONS
CREATE ORDERLY,
EFFICIENT
PROCESSES.**

**A NEW CATEGORY OF
OBJECT-ORIENTED
SOFTWARE IS
SPEARHEADING
THE TREND.**

notorious "islands of automation" and as a way to preserve process knowledge as companies cut their work forces.

Because a single business process may cross many department boundaries, top corporate guns are starting to realize that workflow automation can be the safest and surest way to re-engineer. Workflow provides the metrics, benchmarks and tools for long-term re-engineering.

No wonder workflow is so hot, with more than 70 vendors claiming to provide the technology. Their solu-

tions range from high-end enterprise applications, such as those offered by IBM and FileNet Corp., to electronic-mail-enabled products from the likes of Beyond, Inc. and Reach Software Corp.

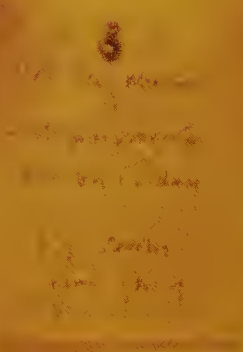
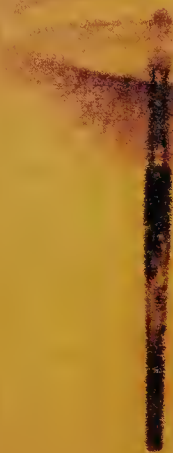
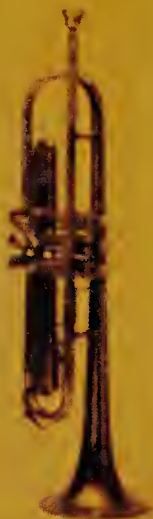
Let the buyer beware, however. There are no true workflow standards, and more than half of the current products were introduced in the last two years. Your long-term success with workflow will depend on your ability to foresee the trends and take advantage of the defining products and technologies. ■

Inside

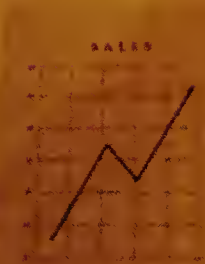
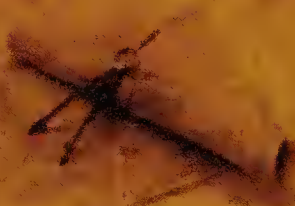
**FIRING LINE:
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The “new workflow software”

is what organizations will increasingly use to tie together diverse applications, people and processes

By Thomas Koulopoulos

Until recently, workflow has been defined by two extremes. On the high end, traditional software from the likes of FileNet and Staffware Corp. is primarily oriented toward developers. On the other end of the scale, “ad hoc” workflow software from vendors such as Beyond, Reach Software and Action Technologies, Inc. is easily built by end users but shows limitations when stretched across the enterprise.

Now, a number of new workflow software products are geared toward business analysts, end users and developers alike. This new software is characterized by three trends: graphical user interfaces (GUI) for depicting and creating workflow; database standards for sharing information and process rules; and object-oriented development environments.

As products incorporate these features, workflow will become the enabling technology for creating enterprise information systems.

Graphical editors

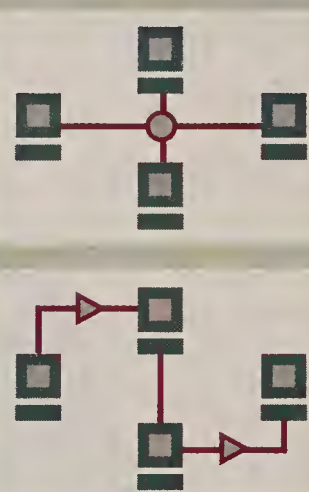
One of the most significant and widespread trends in workflow is graphic development en-

WHAT IS WORKFLOW?

There's a lot of confusion between the terms “workflow” and “workgroup computing.” The difference is blurred by offerings such as Microsoft's At Work and Lotus' Notes, which provide platforms for workflow but are primarily workgroup products. Here's the difference between the two:

WORKGROUP products let workgroups or individuals transfer and share information with one another. The key ingredient is information.

In a **WORKFLOW** application, the process knowledge that applies to the information is also managed, transferred and routed. The key ingredient is the process.



vironments. Using icons, developers and users can create on-screen flow charts to depict any workflow process.

The best thing about these graphic representations is that you can represent complex processes at a high level of abstraction. Then, by employing drill-down capabilities, users can explore the process in detail.

Imagine an aerial view of your office with arrows pointing to and from each task and individual. Envision coming down from that same view to the detail of a single person's task and activities.

This type of graphical representation becomes particularly important when you need to ensure that everyone — users and developers alike — completely understands the processes and their components.

Although Sigma Systems, Inc.'s Omnidesk was one of the first to provide this type of facility in 1991, at least half of all workflow products offer it today.

The question in many developers' minds is, “Can you really develop a complex application with a GUI?” The practical answer is that the product also needs to provide a set of applica-

XSoft's InConcert: Its open workflow platform and programming and database tools find favor with both in-house and commercial systems integrators

XSOFT'S INCONCERT

■ Evaluators said InConcert is a good workflow platform with strong reliability, good programming tools.

■ But, they added that its Unix dependence makes InConcert hard to install and integrate in a PC-based LAN environment.

A number of workflow products are based around an application such as electronic mail or imaging.

Not XSoft's InConcert. An open workflow “engine” with programming and database tools, InConcert can be customized to incorporate standard, off-the-shelf applications into a larger workflow system.

It is by no means an off-the-shelf workflow solution but one that demands some initial training and consulting from this Cambridge, Mass.-based subsidiary of Xerox Corp.

Evaluators included technical personnel at a software developer with large federal contracts; a systems integrator installing InConcert in a major bank; and a telecommunications firm.

The format for this evaluation was created with the help of How-

ard Rubin Associates and Technology Investment Strategies Corp.

Installation

Evaluators said the installation was average. The Unix-based InConcert server did require Unix technical expertise, although not more than other Unix products do, they said.

Developer: “If you don't know Unix and its technologies, it's very difficult to set up.”

Reliability

Although it has been available commercially for nearly a year, InConcert has been in development — originally as part of a military software project — since 1988. Evaluators said it was highly stable because of its lengthy development cycle.

Integrator: “We can't get it to break.”

Performance

Performance was difficult for the evaluators to assess. They said there are no products to compare with InConcert because they are still in development phases and that underlying network performance affected InConcert performance.

Security

InConcert security is based on Unix security features. Evaluators said security provisions were adequate for their needs.

Developer: “The weakness for us is Unix, not InConcert.”

Support

All of the evaluators had extensive contact with XSoft support personnel. They considered this contact reasonable due to the complexity of their applications. They also said XSoft support personnel were competent and efficient in answering technical questions and fixing software problems.

Integrator: “They have a dedicated [support] team that takes their job seriously.”

Ease of use

Once installed and configured,



tion programming interfaces (API) that allow calls to be made to other applications.

Database integration

Every workflow consists of three basic items: the rules that govern a process, the information being routed and the process metrics used to report on the process.

For instance, a mortgage application needs to be underwritten, contains a variety of forms and takes approximately two weeks to be processed.

Early implementations of workflow stored such rules and process metrics in a proprietary format. In the past two years, products have emerged that store all parameters in an industry-standard database, such as those from Oracle Corp., Sybase, Inc. or Informix Corp.

Databases can also track the status of workflow processes and maintain a historical audit trail of each transaction. So, for instance, you can collect vital statistics about the efficiency of the workflow process, such as average transaction volumes and process times, to be stored for management reporting.

It is here that many workflow products fall short. It is also where some of the most significant and promising advances in workflow seem to be coming.

For instance, some products allow you to link the database to a statistical or graphics package to create a powerful business analysis tool. Staffware provides statistics that a manager can view in real time to review the performance of a workgroup or individual. The manager can then dynamically balance work loads or reassign tasks based on work load.

Database integration is an imperative for maintaining the long-term viability of enterprise applications. Although it's not possible

THE NEW WORKFLOW

When to use it

Best used for enterprise applications that can't be precisely defined, are very changeable, require a great degree of reliability and need to be developed quickly.

EXPECT TO PAY:

**\$500 to
\$2,000
PER SEAT**

Typical app

A marketing application for coordinating a new product rollout. Each product rollout may require a different combination of programs and people. The process is not a precise sequence of tasks but can be modeled in components, or objects, which are then recombined for each specific process.

The technology involved

The most visible component of object-oriented workflow is the graphic development environment, which can be used by developers — and in some cases, end users — to create workflows by manipulating icons that represent tasks, users, processes and routing objects. Object libraries provide integrity and reusability for large-scale enterprise workflow applications.

How much it costs

\$500 to \$2,000 per seat, software only. (Hardware and integration may double these costs, especially in high-end enterprise systems.) These products are typically priced on a client/server basis, with a set price for each server and an incremental price for each client.

today, database repositories will become a way to share workflow processing rules among different workflow applications as standards emerge.

In the interim, databases provide an open and accessible place to store the process knowledge that organizations accumulate when developing their workflow applications. Nothing could be worse than making an enormous investment in this intellectual asset only to find that it is locked within a proprietary warehouse.

Object orientation

"Object-oriented" is fast becoming the rallying cry of workflow vendors, old and new. This technology is ideally suited for workflow because it combines information objects (documents and data) with the processing rules and parameters that govern them. The "object" in an object-oriented workflow system becomes a combination of information and process.

You can define business processes faster with object-oriented workflow software than with traditional code by using inheritance, object classes and encapsulation. Code libraries help preserve an object's attributes throughout all process models.

In addition, you can create super classes and subclasses of objects. For example, purchase orders may be a subclass of the procurement process model but also a superclass for order processing. Encapsulation masks all of this complexity within a single object or icon, which can be bundled with any combination of other objects for incorporation into a new workflow.

When coupled with a graphical development environment, object-oriented technology provides a high degree of integrity for enterprise-

Workflow, page 102

InConcert was virtually transparent to end users. Users access tasks in the workflow through an InConcert icon on their desktop. When these tasks are opened, InConcert retrieves and presents documents and applications. The evaluators wanted a better interface, preferably Windows-based.

Integrator: "In its Unix form, it is not easy to use. We want to see it as more of a Windows client."

Developer: "I wouldn't unleash [InConcert] on amateurs."

Programming

InConcert presents more than 400 application programming interfaces for developers. These can be accessed through C, C++ or other languages. Evaluators said the programming capabilities were strong but required a few days of training.

Maintenance

The evaluators were reluctant to rate maintenance because they were still in development stages.

Platform interoperability

Based on the Unix operating system, InConcert is an evolving product that is still undergoing im-



provement and modification. Though it is usable with a number of SQL databases and can be run on DOS/Windows client systems, evaluators agreed that better support for Windows and Novell, Inc.'s NetWare was needed.

Integrator: "It's not load and go by any stretch of the imagination."

Application interoperability

InConcert's major strength, evaluators said, is that it can integrate virtually any standard application for use in a larger workflow system. The developer had integrated 55 applications with InConcert; the systems integrator said he used to integrate Microsoft Corp.'s Office with an imaging application.

Developer: "It's almost as easy to add a new CASE tool to an [InConcert] activity as it is to add a new application to a Windows desktop."

Price

Evaluators said they thought InConcert's price was marginally acceptable but that it could be lowered to be more consistent with other desktop applications.

Integrator: "We tell [XSoft] that

they have to get the price down."

Value

Evaluators rated value very high. They said they knew of no other workflow products with the flexibility and capability of InConcert.

Integrator: "It has more capability than the XSoft sales team knows about. It's amazing what it can do."

Written by Computerworld senior editor Garry Ray.

COMPUTERWORLD'S FIRING LINE

is an evaluation based on interviews with major users at corporate and educational installations. The product under evaluation is being used in live application environments.

XSOFT RESPONDS

Installation We have spoken to customers and are working [on easier installation]. The new Version 2.7 is substantially easier to install and eliminates a lot of questions and decision-making. [Installation is] complicated by the fact that we support so many configurations, which requires some flexibility in the software.

NetWare/Window Support We will be adding support for different platforms over time. We've already added a number of Unix platforms and PC clients. Our major focus for this year will be support for NetWare clients, and we will be porting the InConcert server into the Novell environment.

Workflow

CONTINUED FROM PAGE 101

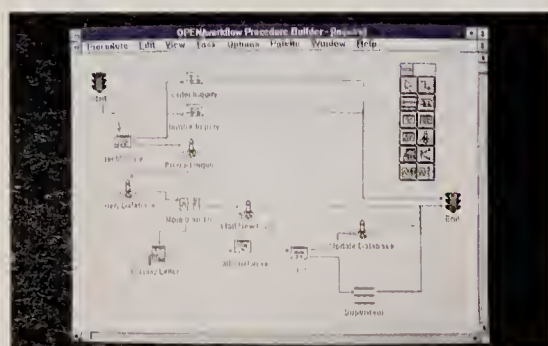
wide development efforts. Recognition International's Floware, for example, not only lets you drill down within its graphic workflow representations but also preserves the integrity of subprocess libraries. Any change made to a subprocess is propagated to every



XSoft's InConcert allows developers flexibility in defining tasks

other process that relies on the same subprocess.

Consider a mortgage processing scenario, where one task, underwriting, may contain a number of subtasks, such as credit review, salary verification and acceptance/denial. The last subtask, acceptance/denial, may be used for a variety of tasks, not just mortgage



Wang's Open/Workflow lets developers create workflow models in an icon-driven desktop

processing. Yet it needs to be defined only once.

A number of workflow products (see list at right) are increasingly viewing the document as the unifying object in a workflow process. This approach works best in publishing or authoring applications that involve workgroups.

The future of workflow

As workflow continues to infiltrate the enterprise, it will become a building block of information systems. But first, workflow products need to gain stronger analytical tools and a tighter integration with desktop environments.

Most noticeably lacking in current software is the ability to simulate workflow procedures prior to implementation. Vendors will begin offering simulation tools within the next two years as business process redesign becomes more of a science.

Workflow will also increasingly be assimilated into operating sys-

tems. Ultimately, we'll see it included in desktop environments such as future object-oriented versions of Windows and Notes. Notes, specifically, is fast becoming the introduction to workflow for many workgroups. In fact, look for Notes to be integrated with many current workflow vendors in the next few months.

Desktop integration will be especially critical as more applications offer workflow as an option.

For example, vendors such as WordPerfect Corp. have already incorporated routing instructions into their documents. Such moves will increase awareness and demand for workflow, but problems will arise as developers push the limits of such low-end workflow.

Without standards, such as those being proposed by the Workflow Management Coalition, low-end limitations could become a severe obstacle. Users will soon demand standards that allow multiple products to work together and share workflow objects, much as SQL databases can today.

Ultimately, workflow will become the most ubiquitous of all desktop technologies, being nothing more than another icon on the desktop. These icons, or agents, will perform the myriad tasks of today's office worker. They will automatically route documents to co-workers based on rules that represent the processes governing the enterprise. These simple icons will become the most valuable asset of any enterprise.

Placing your bets

Whom do you bank on in such a diverse market? First, look for vendors making headway in the areas mentioned in this article. Second, don't invest in workflow technology that replaces your desktop. Look for technology that works with existing electronic-mail, workgroup and desktop systems.

Finally, and most important, remember that workflow is ultimately more than just a technology. It is an overall environment and approach to uniting and automating business processes. That will create a solid foundation and, more important, a precise education on the benefits and obstacles of organizational change. ■

Koulopoulos is president of Delphi Consulting Group, a Boston-based consulting firm that specializes in workflow, document management and imaging.

OBJECT-ORIENTED SAMPLING

Vendors moving into object-oriented

FileNet Corp.'s Visual Workflo: Strong implementation of workflow library procedures. Stated direction is to give end users the tools to design, define and manage workflows. Targeted for release later this year.

IBS' Workflow Manager: Heavily based on agent technology. (Agents browse, route, archive and otherwise process workflow information.) These agents read their instructions from a standard data dictionary.

IMC, Inc.'s ImageMover: Heavy emphasis on database infrastructure, which provides high integrity. Remote procedure calls facilitate enterprise implementations.

Sigma Systems, Inc.'s OmniDesk: One of the first products to use a graphical development environment. Strong set of application programming interfaces.

Staffware Corp.'s Staffware: Especially strong in reporting. One of the few products that offers true, real-time monitoring of work queues. Supports many links to outside applications.

Optika Imaging Systems, Inc.'s Optika: Very strong Windows integration with a heavy emphasis on agent technology. Still linked with imaging but quickly moving into stand-alone workflow applications.

Recognition International's FloWare and MapBuilder: Strong implementation of referential integrity of procedures across multiple workflows. Upcoming FloWare Desktop due out this spring is also aimed at providing visual workflow tools to line-of-business managers and supervisors.

Viewstar Corp.'s Viewstar: One of the oldest object-oriented workflow products. All workflow items, including routes, work packets and procedures, are stored in a reusable object library, which supports features such as inheritance.

New to the market

IBM's FloMark: Well-architected with a strong implementation of instances, which allows you to send several information packets through a workflow at the same time. Each will take a different route through workflow. IBM is also the only vendor currently using an object database.

Hewlett-Packard Co.'s WorkManager: HP has a significant precedent in the object interface market with NewWave, its office automation graphical environment for Windows. NewWave is heavily based on agent technology, which is a form of encapsulation.

Wang Information Systems, Inc.'s Open/Workflow: Perhaps the best iconic representation of workflow for a developer. Should be available by the second quarter. Wang's business process design methodology should complement Open/Workflow well.

XSoft's (division of Xerox Corp.) InConcert: Very strong support of database repository and flexible definition of workflow parameters. Database tables can be modified with new attributes defined by the developer. The database also stores audit information for reporting purposes. Provides a data flow-like graphical user interface for developers.

Document management focus

Interleaf, Inc.'s RDM: Particularly strong in publishing and compound documents. Moving toward the concept of intelligent documents that "learn" to route themselves.

Documentum, Inc.'s Documentum: Very strong in virtual document creation and database integration with the document workflows.

Keyfile Corp.'s Keyfile: Originally considered a tool for ad hoc workflow, it has successfully positioned itself in the ranks of enterprise workflow by focusing on the importance of document workflow across an enterprise. One of the easiest to learn.

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9:00 - 12:20 General Sessions

- ◆ Industry Dynamics - The IDC Perspective
- ◆ Annual Global IT Spending Survey Results
- ◆ Industry Competition
- ◆ Digital Media Convergence

1:40-2:15

2:20-2:55

3:20-4:00

4:00-4:40

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The New Priority for
Corporate IS



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The oldest type

of workflow — usually referred to as “transaction-based” — has its roots in imaging.

Imaging vendors such as FileNet and Viewstar realized early on that electronic documents would still need paper bridges if the documents weren't also electronically routed and processed.

This type of workflow system still holds a great deal of appeal for certain organizations — ones with applications that can benefit both

from imaging and from a very stringent, complex workflow process.

However, only about 50,000 people currently use this type of workflow system, according to Delphi Consulting Group in Boston. Many of the vendors involved in this market are working on or releasing products that are geared toward the new workflow.

TRADITIONAL WORKFLOW

When to use it

For highly structured, high-volume, production-based applications involving lengthy, repetitive and complex tasks. In this type of static environment, consistent throughput is the primary concern.

EXPECT TO PAY:
\$2,000 to
\$10,000
PER SEAT

Typical app

An insurance claims processing application, which consists of a finite series of tasks that are repeated with predictable input, routing, individuals and results.

The technology involved

Requires the scripting of workflows in a graphics- or code-based language. These scripts ensure the integrity of the process.

How much it costs

Be prepared to pay \$2,000 to \$10,000 per seat, software only. (Hardware and integration may double these costs, especially in high-end enterprise systems.) These systems often require integration services for even a basic implementation, which accounts for the high cost per seat.

Sample vendors

Sigma Imaging Systems, Inc., Computron Technologies Corp., Staffware Corp., FileNet Corp. and Viewstar Corp.



FileNet's Workflo receives high satisfaction

of stability and production volume, but garners lower ratings in the categories

FILENET'S WORKFLO BUSINESS SYSTEM

**TOTAL
SCORE**

78

Based on its pioneering position in image processing, FileNet Corp. commands the most market share in transaction-based workflow software. FileNet's Workflo product line has been available for more than 10 years.

Workflo's latest Version 3.1 remains a set of products intended to enable users to create mission-critical client/server workflow applications. Its Systems Development Kit for Windows was designed to reduce development time and maintenance costs.

Users surveyed in this Buyers' Satisfaction Scorecard gave the product an overall score of 8.2, indicating very high satisfaction with the product's ability to perform in the 14 categories rated.

The categories considered key to transaction-based workflow applications were derived from interviews with market analysts. Lists of potential users and vendors of workflow software were provided by a nonvendor, third-party source.

Only FileNet Workflow 3.1 users who were using it in a transaction/production application were asked to complete the survey. Users assigned a 1-to-10 rating to the product for each category, where 1 is the lowest rating and 10 is the highest.

Written by Kevin Burden, features research coordinator at Computerworld.

HIGHEST-rated categories

RATINGS ARE BASED ON A 1-TO-10 SCALE, WHERE 10 IS BEST.

9.1	STABILITY OF VENDOR
8.7	ABILITY TO MEET HIGH PRODUCTION DEMANDS
8.7	ABILITY TO KEEP UP WITH NEW TECHNOLOGY
8.7	CONDITIONAL ROUTING ABILITY
8.6	PARALLEL ROUTING ABILITY
8.5	SCALABILITY

FileNet was the pioneering force for the workflow market back in 1985. Its users take pride in this fact, and some said its stability has increased as it transforms itself from a hardware to a software vendor. FileNet's products are usually ahead of the market, several users noted. Regarding actual workflow functionality, users said the product excelled in every kind of routing ability.

LOWEST-rated categories

RATINGS ARE BASED ON A 1-TO-10 SCALE, WHERE 10 IS BEST.

8.0	PROGRAMMING LANGUAGE
7.9	VENDOR'S TECHNICAL SUPPORT AND SERVICE
7.9	EASE OF USE
7.8	GRAPHICAL USER INTERFACE
7.6	ABILITY TO RUN A VARIETY OF PLATFORMS
7.2	FLEXIBILITY OF WORKFLOW PROCESS

But several users complained that the GUI was limited in how it performed, which added to the product's complexity. When an application is so complex that the vendor's technical support staff is heavily sought after, connecting with them can be a problem. In dealing with the phone support staff, users said they were either too slow with their replies or too busy to effectively help with users' problems.

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 - 31. Programming Management, Software Developers
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- | | |
|---------------------------|--|
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| (b) Netware | (f) Windows NT |
| (c) OS/2 | (g) Windows |
| (d) Unix | (h) NeXTstep |
| App. Development Products | ☐ Yes ☐ No |
| Networking Products | ☐ Yes ☐ No |

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 - 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
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- 70. Medical, Legal, Accounting Mgt.

OTHER PROFESSIONAL MANAGEMENT

- 80. Educator, Journalists, Librarians, Students
- 90. Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)

Operating Systems

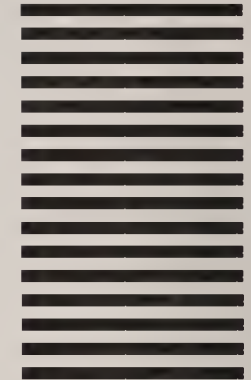
- | | |
|---------------------------|--|
| (a) Solaris | (e) Mac OS |
| (b) Netware | (f) Windows NT |
| (c) OS/2 | (g) Windows |
| (d) Unix | (h) NeXTstep |
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| Networking Products | ☐ Yes ☐ No |

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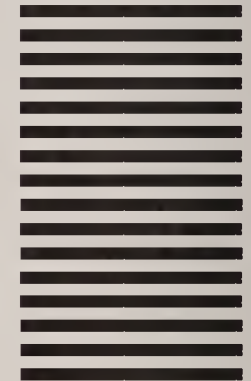
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The most common workflow — and the one with the lowest entry cost — is known as “ad hoc” workflow.

Delphi Consulting Group estimates that nearly 250,000 people use some form of ad hoc workflow. The type showing significant promise is electronic-mail-based; it uses E-mail standards such as VIM, Messaging Application Programming Interface or Message Handling Service to transmit workflow documents.

One benefit of this approach is

the simple and comfortable metaphor that E-mail has established in most organizations. This minimizes the cultural resistance and investment in customized application development.

On the other hand, you can hit severe limitations when you try to use E-mail-enabled workflow for large-scale, enterprisewide applications.

AD HOC WORKFLOW

When to use it

For dynamic workgroups with individualized workflow processes. Although some portion of the process model may get reused, there is not enough consistency to justify the creation of structured transaction-based scripts.

EXPECT TO PAY:
\$200 to \$1,000
PER SEAT

Typical app

A customer support representative may route documents and information relating to customer questions to a variety of technical experts based on the specific questions and problems of a customer.

The technology involved

Requires the use of graphical workflow design tools that are easily created/modified by the user. Many programs in this category also rely on electronic mail as the routing technology. Ad hoc products are beginning to focus on the concept of intelligent agents, which can perform workflow tasks even if the individual responsible is unavailable.

How much it costs

\$200 to \$1,000 per seat, software only. (Hardware and integration may double these costs, especially in high-end enterprise systems.)

Sample vendors

Action Technologies, Inc., Beyond, Inc., Reach Software Corp., Jet-Form Corp. and Verimation, Inc.

ratings, with strong marks in the areas of flexibility and multiple platforms

HOW LIKELY would you be to purchase this product again?

NUMBER OF RESPONDENTS: BASE 13
(REASONS BASED ON THE MOST FREQUENTLY STATED RESPONSE)



Reasons: Met all our expectations, all tools needed are in one package, has enhanced our customer service

ARE YOU INTERESTED in object-oriented capabilities for your workflow software?

NUMBER OF RESPONDENTS: BASE 13



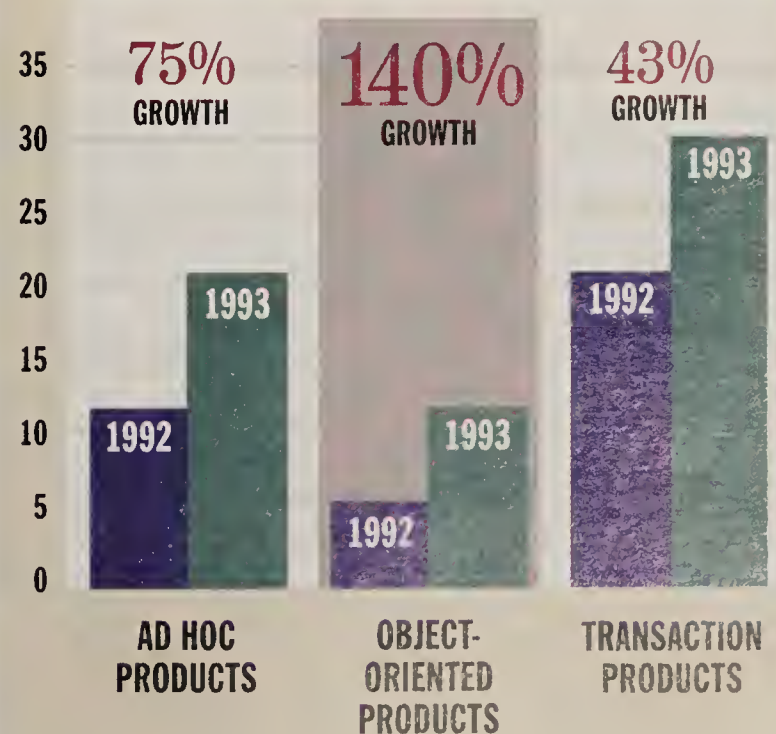
MOST IMPORTANT improvements users would like to see

1. Independent platform, increased flexibility
2. Increased user-friendliness
3. Reduced installation costs
4. Increased compatibility with external applications
5. More object-oriented
6. Better integration with text documents
7. Improved fax gateway
8. Increased robustness of database
9. Separate workflow from the application for more flexibility
10. More user input allowed before product release

TOP IMPROVEMENTS ARRANGED IN ORDER FROM MOST TO LEAST IMPORTANT. IMPROVEMENTS ARE TAKEN FROM THE MOST FREQUENTLY STATED USER VERBATIMS.

Of the workflow types, object-oriented products are seeing the highest growth

An increasing number of new products are claiming workflow features. The highest growth has been in object-oriented and ad hoc applications.



(Note: Includes products that provide features in more than one category)

Source: Delphi Consulting Group, Boston



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PURE OBJECT VS.
OBJECT RELATIONAL

The DBMS wars



R. Cattell: *Extending SQL is just no match for the logical richness and extensibility of the object model*

SOUND OFF!

AT ISSUE: Companies want DBMSs that can handle complex data types, which is fueling interest in DBMSs with object-handling capabilities. The debate? Whether pure object DBMSs beat the pants off relational DBMSs with object extensions. Two gurus go head-to-head.

BY R. G. G. CATTELL

Object DBMSs love complex data

You can't create a revolution in the database management systems market by covering the same old ground. So while relational DBMSs and extended relational systems (such as object-relational systems) might be fine for some companies, the only way users are going to make a leap in DBMS functionality is to find out what pure object DBMSs are all about.

Naysayers might claim that object DBMSs are just a niche. But numbers indicate that the object database market is experiencing revenue growth that very closely parallels the early relational industry. By 1998, according to International Data Corp., object database revenue should hit \$1.1 billion.

Object DBMSs offer revolutionary advantages that are not likely to be achieved by adding on to the relational model, which is the strategy of the object-relational camp. In addition to supporting conventional DBMS functionality, today's object DBMSs deal with high-performance complex data. This ability stems primarily from the object model itself and from seamless integration with the programming language environment.

It will be nearly impossible to evolve SQL to support extensibility and the logical richness inherent in the pure object model. For example, a new "object" type has been proposed as an addition to SQL3, but the results of queries are still collections of records.

For object DBMSs, however, the result of a query can be any shape or type of data you can
DBMS wars, page 112





BY MICHAEL STONEBRAKER

Get your objects but keep your SQL

I have seen the future of database management systems, and it is object-relational DBMS.

Businesses today want a system that can provide SQL to all their data, coupling new kinds of objects, such as maps and video, to traditional corporate data. No file system, no relational DBMS, no object DBMS can do that.

The beauty of object-relational technology is that it gives users the richness and depth of object technology without dislocating companies from their investment in industry-standard SQL, which totals nearly \$4 billion in annual revenue for the relational DBMS industry.

The object-relational model incorporates the best of the relational and object worlds — inheritance, methods, polymorphism and other object-oriented attributes — and couples those with relational features such as transaction control, security and recoverability.

I can't imagine another database technology that can handle complex search capabilities as easily. Object vendors have limited SQL features; for example, they often cannot do updates. And while other DBMSs are limited by the types of data they can handle (namely, character strings, floating points, integers, time and currency), object-relational DBMSs add new data types easily. Users can search images, photographs, maps, video, compound documents and other new data types using SQL.

Want to find all sales leads from a trade show that are located within 25 miles of the Western regional office? You can do it. Want to know which rivers are within 20 miles of a toxic spill site? No problem. Want to find all photos of the New York skyline taken at sunset? Object-relational DBMS lets you find that information.

Companies are no longer unable to query nearly 80% of their valuable corporate data because it's not in the form of simple character strings and numbers.

Best of all, with more data types stored in the database, applications can be smaller and more elegant, developers can reuse software and information systems staff can enable a new generation of business applications.

The Sequoia 2000 benchmark (STON93), which abstracts a remote sensing and geographic information systems application, illus-

trates one way customers use an object-relational DBMS. This benchmark contains queries that search data based on raster values, spatial location and topographic features.

Relational DBMS and object DBMS vendors are gunning for the object-relational piece of the pie, but there's a lot that stands in their way.

Pure object DBMSs, for their part, are mere pretenders to the DBMS throne. This technology, which offers persistence in programming languages, focuses on problems that do not require search capabilities for complex data.

For example, the 001 benchmark (CATT92) assumes customers will simply have programs that read objects, perform functions on those objects and then return them to storage. This benchmark typifies the emphasis by the object DBMS vendors on high performance for persistence in the C++ language. It does not reflect the need for customers to search the database, which is a strength of relational database platforms.

Object DBMS vendors have an annual revenue of only about \$50 million to date, a lot less than the SQL market. That's because object DBMSs offer only persistent objects, not fully functional DBMS capabilities.

Pure object DBMS offerings have only a small part of the functionality they need today. They lack the query capabilities, optimizers and scalability of both relational and object-relational databases. Furthermore, all object DBMS vendors run their products in the same address space as the user's program. That

means there is no protection barrier between a client application and the DBMS. Security becomes a grave issue because data can be destroyed easily.

For relational vendors, their enormous investment in the internal monolithic architectures is a liability as they attempt to migrate to an object-relational setup. Rewriting from scratch is a technical risk and substantial investment. These companies have to implement new parsers, view support systems, optimizers and executors for an extended SQL language.

Also, users are going to get poor performance out of systems that drop an object-relational wrapper on a relational DBMS because the wrapper must perform a complex and expensive simulation of object features. This is akin to simulating a Ferrari on top of a go-cart.

And if a relational DBMS vendor decides to partner with an object DBMS vendor to get the technology it needs, customers have the burden of supporting two databases, two sets of upgrades and two of a lot of things while the merger takes shape. Do you really want to write complex applications that arbitrate between the two database systems? This option is technically tough, risky and inconvenient.

If I were an IS manager, my choice for a future DBMS would be pretty clear. ■

Stonebraker is chief technology officer at Montage Software, Inc. in Oakland, Calif., and a professor of computer science at the University of California. He is co-founder of Ingres Corp.



Michael Stonebraker: Pure object DBMSs lack query capabilities, optimizers and scalability

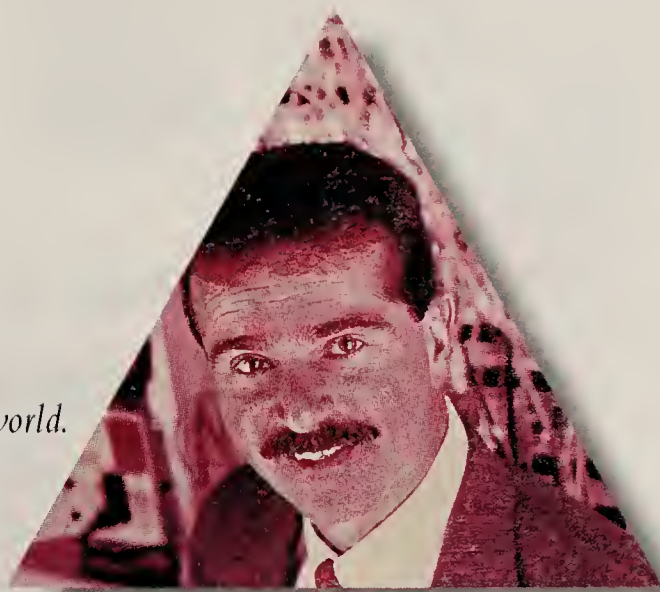
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Craig Goldman
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In the information market, this much is clear: Vendors make the products. IS managers make the decision.

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DBMS wars

CONTINUED FROM PAGE 108

define in your programming language: a table of records, a graph of workflow nodes, a hierarchy of photos in an organizational chart, vectors in a drawing, time-series data and so on.

Writing an application with an object DBMS is fundamentally simpler than

with other DBMSs because the DBMS is seamlessly integrated with the programming language environment. You

get better programmer productivity because the programming language data structures can be made "persistent" — that is, they can automatically be stored and fetched from the database.

By contrast, extending a relational

SOUND OFF!

DBMS to accommodate object concepts still requires programmers to split applications into

parts written in the programming language and parts written in the database language (SQL). Not only do programmers have to learn both languages and become proficient in them, but they also have to explicitly translate data from da-

tabase records to programming language data structures and vice versa.

It's hard to ignore that object DBMSs offer substantial performance advantages over relational and object-relational DBMSs for distributed computing and complex applications.

For instance, an application program can fetch or modify cached data about 10,000 times faster with an object DBMS than with other DBMSs because the DBMS can execute on workstations and can avoid interprocess calls.

An object DBMS also greatly reduces server loads: Only 10% of the DBMS that deals with transaction management need be on servers. Therefore, distributed applications can use the computing power of a network of workstations to improve performance dramatically.

Finally, complex queries can be executed much faster using object DBMSs, particularly as databases become large. Because object DBMSs support object pointers in addition to indexes, they traverse only the data of interest to a query and avoid expensive relational joins and index lookups.

A lot of myths that competitors promote are based on early object DBMS releases. But recent object DBMS products have some impressive capabilities and features, including the following:

- Applications portability across products and programming languages, thanks to an industry standard for object DBMSs (ODMG-93). All major object DBMS vendors have committed to releasing standard-compliant products by early 1995.
- Complex query capability and support for ODMG-93's query language, OQL, by major object DBMS vendors. OQL is more powerful than SQL3 in the type of query results it produces and in its ability to mix a programming language and queries. Products can also support the needs of customers who want straight ANSI SQL on object databases.
- A new generation of graphical application development tools that leapfrog relational DBMS' fourth-generation language-based technology. Vendors also have traditional report writers and performance monitors.
- The equivalent of relational views and object encapsulation. These features provide a powerful paradigm for data independence. In contrast, there's relatively little experience with handling objects in object-relational models.
- Data security at an object, page or object-group level using a protected server providing higher performance by caching data in a client address space.

It's true that relational and object-relational may be good DBMS alternatives for certain applications; for instance, relational DBMSs work well for on-line transaction processor applications. But when it comes to the new generation of applications, the best choice is frequently going to be object DBMSs. ■

"You can be a sheep, or the shepherd."



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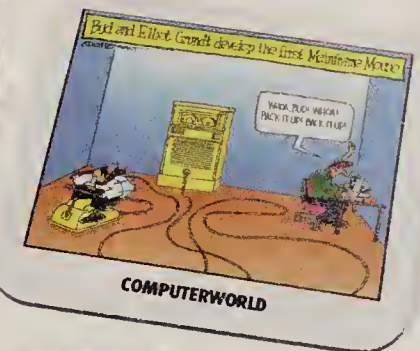
Cattell is a distinguished engineer at SunSoft, Inc. in Mountain View, Calif., and is the author of a popular book on extended relational and object databases. He is also chairman and editor at ODMG.

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the first Main-
frame Mouse."
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8 1/2" x 7 3/4".

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bathroom scale
doing in my laptop
case?"
Roomy 100% natural
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webbed straps, 14" x 9".



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TAKE THE BITE OUT OF OS/2

NEED to know

By Joe Panepinto

ADVOCATES TOUT OS/2 as the only industrial-strength 32-bit, multitasking, multithreading desktop operating system on the market. But with this kind of functionality comes an equally large need for good tips, which are hard to come by.

Experience, as they say, is the best teacher. Larry Maloney, a software engineer at Cincom Systems, Inc. in Cincinnati, found developing OS/2 applications similar to developing for Windows using the Windows Software Developers Kit.

Building a multithreaded, multitasking application for OS/2 in C or C++ simply means embedding a process within a process. For example, you can build an OS/2 word processing application that has a print feature as an embedded process. The print task does not run as a separate routine but as a subprocess or thread in the background.

"Threads give the programmer more power to build applications that take advantage of the operating system," Malo-

ney says. "It's not any harder to do, it just means you have to rethink your programs."

John Maynard, a senior systems programmer at the University of Texas' Health Science Center in Houston, started hacking around with OS/2 2.0 and found more helpful information in the Usenet news group comp.os.os2 on the Internet than he did in the manuals. He also found the book *OS/2 2.1 Programming* (Osborne/McGraw-Hill) helpful.

"I would consider the FAQ an absolute must," says Maynard about a resource on the Internet. "It [lists] all the questions that just about everyone winds up asking when learning OS/2."

The learning curve

Maynard had never done graphical user interface (GUI) programming, so for him the concepts of message-based processing and setting up a message queue integral to an OS/2 Presentation Manager application were foreign.

For example, in Presentation Manager all input from the user — keyboard and mouse movements — is sent to the appli-

OS/2's manuals and on-line help

facilities will get you started, but

they won't answer all of your

questions. Experts recommend

checking out the Internet for advice.

cation in message form. As a result, OS/2 applications do not have the straightforward I/O paradigm that non-GUI programmers use, Maynard says.

If you are a non-GUI programmer, expect to invest up to six months of hands-on experience to master it, says Sanford Rockowitz, president of Minaret Software in Daly City, Calif. The same level of difficulty is found in any GUI environment, he says.

The real learning curve, says Jeroen Hoppenbrouwers, a research engineer at Infolab in Tilburg, Netherlands, is in the system calls, which include calls to manipulate processes, threads and 32-bit virtual memory.

Hoppenbrouwers hastens to point out that multitasking can cause problems for programmers, as well as offer opportunities. Because of OS/2's multitasking capability, an application cannot count on the processor 100% of the time; therefore, time-sensitive jobs that work under DOS and Windows may not work under OS/2.

OS/2 can also run multiple DOS appli-

cations — each under its own Virtual DOS Machines (VDM). The VDM feature prevents the entire system from crashing when there is a bug or crash in one DOS application. Charles Oldham, a systems analyst at the North Central Association Commission on Schools in Tempe, Ariz., uses OS/2 to develop DOS applications and suggests others do the same, especially for debugging.

For example, an invalid pointer address in an application running under DOS or Windows will "lock up the machine faster than you can blink," Oldham says. The developer then has to go back into the code and search for the bug. An invalid pointer address in a DOS application running under VDM in OS/2 will still crash, but OS/2 will return an error mes-

Where to go on the Internet to get your questions answered

Usenet news groups include the following:

comp.os.os2.programmer
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comp.os.os2.networking
comp.os.os2.bugs

sage that alerts the developer to the invalid pointer address.

"Debugging DOS applications under OS/2 is nice," Oldham says. "You get better error messages and any crashes stay contained within their own partition."

Panepinto is a free-lance writer in Amherst, Mass.

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By Valle Dwight

Get an 'A' in customer service

When Roger Edwards interviewed for his job as supervisor in systems and programming at Standard Insurance Co., the questions were not limited to his technical experience.

Users at the Portland, Ore., company were unhappy with the service they were receiving from their information systems department, so last year the company let them have their say. Now, potential IS employees are interviewed by the people they will service.

While Edwards answered the usual resume questions, interviewers also inquired about his definition of good service, how well he worked with people and his thoughts about what the user's role was in the scheme of his job.

"I found it interesting," says Edwards, who was hired last April. "It's an effective way for users to get a feel for who

At more companies, user input is weighed heavily during the hiring process. Straight answers, fast turnaround and quality workmanship are a must if you want high marks.

they'll be working with."

Gregg Harrod, assistant vice president and treasurer, who interviewed Edwards, says that since users have gotten involved in the hiring process, the quality of the IS staff "has improved immensely," especially in its ability to set priorities based on users' needs.

Keeping users happy and responding quickly is as much a part of the job as writing software and warm-starting the computer. But it has not always been given the same level of importance.

Good service means different things to different users, but almost all agree on some basic factors: fast turnaround, straight answers, quality work and quick fixes when things go wrong.

"Timely resolution. That's a big, big factor," says Mary McKee, manager of financial planning systems at American Airlines. And if the project will be late, she wants to know why. "I don't want to

hear, 'It's a technical thing,'" McKee says.

Others say they would rather have the problem fixed first and hear the explanation later. "The bottom line is, get it fixed. Then follow up with what caused it and what we can do to avoid it in the future," says Gordon Otway, an associate at American Airlines' banking department.

One of users' biggest gripes is not getting straight answers. "We want it explained in lay terms," says Jack McElaney, vice president of telemarketing at Warren, Gorham & Lamont, a publishing company in Boston. "It's no different than a doctor explaining an illness to a patient."

Users are also unhappy when extravagant promises are made and not fulfilled. "People plan their department around it, and it doesn't happen," says Susan Serrell, associate recording secretary at Harvard University. "It doesn't

come when it was supposed to, and it doesn't do half the stuff that was promised."

Many say first-class service starts with understanding a user's business. Often what users need is not what they ask for, and IS must be able to figure that out. Serrell remembers asking for a reference table change, not realizing that to accomplish her goal she needed a software change. "I thought I really knew what I wanted," she says.

To achieve better service, Harvard users have devised a priority system that seems to work. Any problem that threatens to stop business is designated a "fire call." In turn, the IS department responds immediately, Serrell says.

Bob Garofalo, IS director at C & S Engineering in Liverpool, N.Y., took a Dale Carnegie course as part of his push to deliver better service. "We never used to look at users as clients," Garofalo says. "We met their requests with resistance."

Dwight is a free-lance writer in Florence, Mass.

How to earn an "A"

- Use non-IS language
- Say "Here's what we'll do for you" rather than "Tell us what you need"
- Give straight answers, not jargon
- Provide training for all new products
- Offer timely resolutions to problems
- Do it right the first time
- Have one front-line IS person to call for problems
- Design a system for designating priorities

How to earn an "F"

- Provide a system that does not work as advertised
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- Don't answer the phone in the IS department
- Raise expectations and then fall short of them
- Make a system more complicated and costly than it has to be

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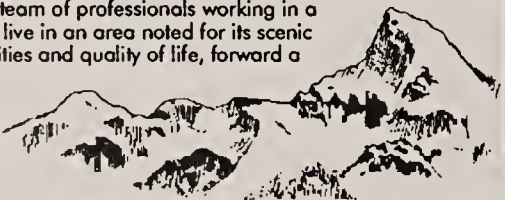
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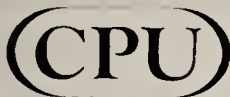
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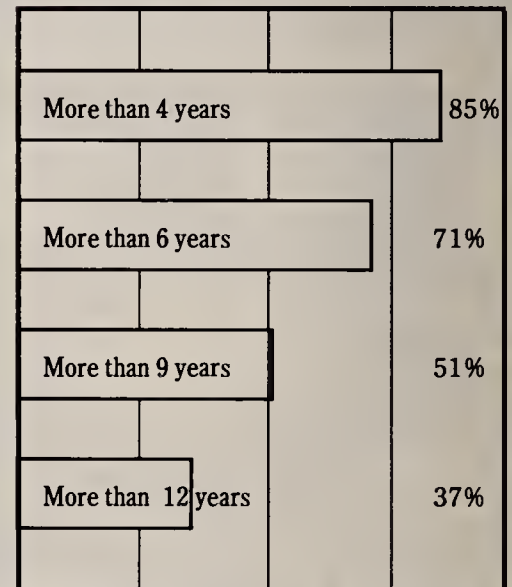
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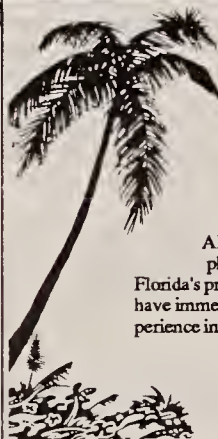
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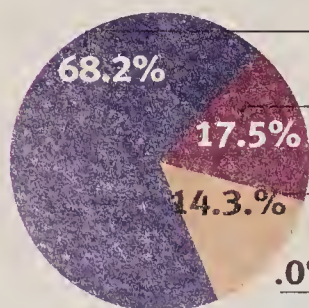
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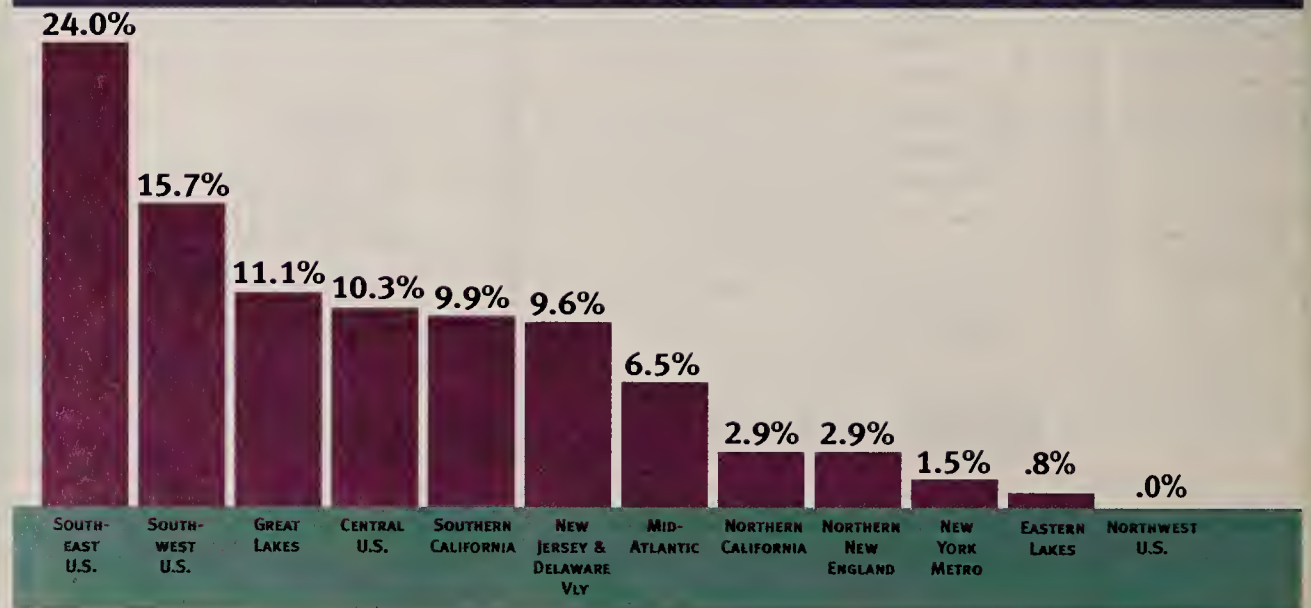


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REMOTE ACCESS FIELD REPORT: SOFTWARE

By Daniel Lyons

Staff members in the information systems department at Banyan Systems, Inc. in Westboro, Mass., never thought video resolution would be an issue when they deployed remote access software to employees. They were blindsided, however, by what is perhaps the most common problems with remote access products.

"We found that you have to have matching resolutions to make these programs work," says Mark Hildebrand, manager of network and computer operations. "That really bit us early on. We had to go out and buy Super VGA monitors for our home users to match the monitors at the office. It was really confusing."

Modems + monitors = messes

The biggest problems with remote software actually have less to do with the software itself than with the devices involved in running it — mainly modems and monitors. The best thing to do is to set standards for both, says Jim Silva, senior technical support representative at Corporate Software, Inc. in Canton, Mass.

"You should standardize all of the equipment and the type of remote software," says Silva, who specializes in remote software products. The biggest

Video resolution and modem compatibility are potential trouble spots connected to remote access software

trouble spot is when the modem is not fast enough.

"When you're handling Windows applications, you have to be running at 9.6K bit/sec. or above, or else it will run very, very slow," says Nick Pezirtzoglou, systems programmer and analyst at OPI International, Inc., a marine construction company that supports users worldwide from its headquarters in Houston. Others recommend 14.4K bit/sec. modems.

Modem brand is also important. "We have lots of problems with people trying to run [Microcom, Inc.'s] Carbon Copy using off-brand, cheaper modems," says David Gregson, manager of user support at Boston law firm Ropes & Gray. "Software manufacturers have a range of modems that they've tweaked their software to work well with. But finding the right one and making sure you have the settings right can be difficult."

Another consideration is how communications will be handled at the home office. Ropes & Gray, for example, uses a modem pool rather than having a modem

on every desk at the office. "With Carbon Copy, we had lots of problems getting it to access our modem pool. We had to reprogram it," Gregson says. Now, Ropes & Gray is switching to PC Anywhere from Symantec Corp. in Cupertino, Calif., partly because it accommodates a modem pool more easily.

Windows versions of remote control software packages are generally easier to use than their DOS predecessors, experts say, however, they can be troublesome, too. For example, loading Carbon Copy for Windows can cause changes in

the SYSTEM.INI file that disable other programs requiring different SYSTEM.INI settings, says John Logan, president of The Logan Group, a consulting firm in Milwaukee. Administrators have to work around the problem by making line-by-line edits within SYSTEM.INI.

"It's extremely complicated," Logan says. "There are zillions of entries. You have to know how Windows operates before you go mess around in there. It's no place for amateurs."

Lyons is a free-lance writer in Ann Arbor, Mich.

And the choice is . . .

There are two kinds of remote access software: remote control and remote node. Each one has its own advantages.

Remote control software lets users tie into a network and take control of a PC. The processing takes place at the main office. With remote node software, a user becomes part of the network. The application is on the user's PC, and the processing takes place there.

To choose the right software, you must consider the applications you run, says Steve Magidson, a partner at Ordinal Associates, a mobile connectivity consulting firm in Thousand Oaks, Calif.

For applications that require a lot of communication between the user PC and the network server, remote control is best because big files do not have to move over the phone line — all the remote user gets is screen repaints. An example of this is database applications in which the remote user needs to download not only the files but also the program needed to run them. With remote node software, such transactions are unbearably slow.

For applications where the processing takes place mostly on the server, and the system is just moving data to the remote user, remote node software is best. An example is electronic mail.

Unfortunately, most companies have a mix of application types, so it is not always clear-cut.

Analysts expect remote node will displace remote control as high-speed modems become more common and moving big files across phone lines becomes less of a problem. For now, some vendors are offering solutions that combine remote control and remote node functionality. These may be the best choice, Magidson says.

Remote control:

Carbon Copy, Microcom, Inc., Norwood, Mass.
pcAnywhere, Symantec Corp., Cupertino, Calif.
Close-Up, Norton-Lambert Corp., Santa Barbara, Calif.

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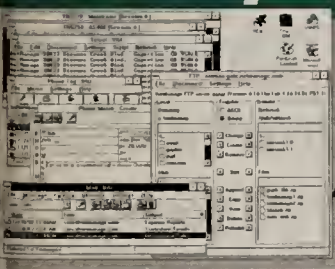
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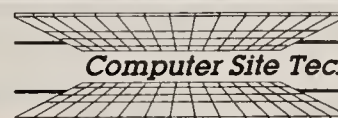
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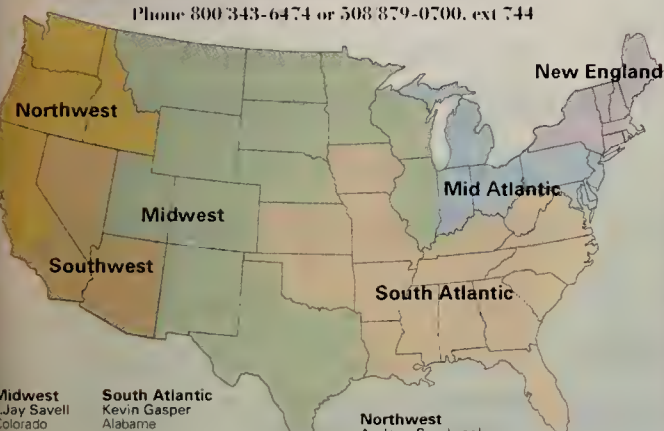
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Friday Stock Ticker

Gainers

Losers

Percent

GANDALF TECHNOLOGIES INC.(L)	38.4	IPL SYSTEMS INC.	-19.4
QUARTERDECK OFFICE SYS.	34.3	KENDALL SQUARE RESEARCH	-17.4
DELL COMPUTER CORP.	20.1	GROUP I SOFTWARE	-15.9
SYSTEM SOFTWARE ASSOC.	15.3	INACOM CORP.	-15.0
TELEBIT CORP.	14.3	COMPUTERVISION CORP.	-11.1
WESTERN DIGITAL CORP.(H)	13.7	CRAY COMPUTER	-11.1
TANDEM COMPUTERS INC.(H)	13.3	KNOWLEDGEWARE INC.	-10.0
SEQUOIA SYSTEMS INC.	12.9	IOMEGA CORP.	-10.0

Dollar

AUTODESK INC.	6.25	ITT CORP.(H)	-3.88
MATSUSHITA ELECTRONICS(H)	5.50	INACOM CORP.	-3.00
COMPAQ COMPUTER CORP.(H)	5.25	PARAMETRIC TECHNOLOGY	-2.75
WELLFLEET COMMUNICATIONS	4.38	SYBASE INC.	-2.50
DELL COMPUTER CORP.	4.13	CRAYUS LOGIC	-2.38
CENTIGRAM COMMUNICATIONS(H)	4.00	NEWBRIDGE NETWORKS CORP.	-2.25
CREATIVE TECHNOLOGIES INC.	3.88	GROUP I SOFTWARE	-1.75
8MC SOFTWARE INC.(H)	3.75	IPL SYSTEMS INC.	-1.75

THE PC SECTOR FARED WELL LAST WEEK. COMPAQ COMPUTER CORP. ANNOUNCED A PARTNERSHIP WITH MICROSOFT CORP. TO ENSURE PLUG-AND-PLAY COMPATIBILITY, WHILE DELL COMPUTER CORP. STOCK ROSE IN ANTICIPATION OF NEW PORTABLES.

Industry Almanac

Pinnacle rises higher

Pinnacle Micro, Inc. (PNCL) in Irvine, Calif., is soaring on the strength of its magneto-optical storage products.

Pinnacle Micro went public last July at 10; the stock closed at 18½ on Wednesday.

High cost and slow data-access times have stifled the optical storage market in the past, yet Pinnacle Micro is making progress on both fronts. For instance, the Pinnacle Micro Sierra drive, released last year, doubles its predecessor's capacity to 1.3G bytes but costs \$200 less. Last week the company also announced new firmware that increases read and write speeds by up to 25% for the Sierra product.

As a result of such innovations, the 7-year-old company is enjoying rapid growth. Its recent fourth-quarter financial results showed sales up 43% over the previous year, to just more than \$11 million.

James Utz, an analyst at OLDE Equity Research in Detroit, said he expects Pinnacle Micro's earnings to accelerate as the company introduces new products and expands its market penetration in the coming year. Utz noted that magneto-optical storage is a preferred medium for emerging multimedia and digital audio/video applications. He estimated industry growth of more than 40% during the next three to five years.

Utz rated Pinnacle Micro shares a Buy.

—Derek Slater



EXCH 52-WEEK RANGE FEB. 25 Wk NET Wk PCT 3PM CHANGE CHANGE

Communications and Network Services				UP 1.30%		
OTC	63.25	19.63	3 COM CORP.	57.88	0.50	0.9
NYS	45.56	35.50	AMERITECH CORP.	40.00	-1.13	-2.7
NYS	65.00	51.63	AT&T	52.63	-1.38	-2.5
OTC	26.50	12.50	8ANYAN SYSTEMS INC.	14.75	-0.25	-1.7
NYS	69.13	50.75	BELL ATLANTIC CORP.	54.38	1.63	3.1
NYS	63.88	50.63	BELLSOUTH CORP.	55.63	2.00	3.7
NYS	17.00	4.25	BOLT, BERANEK & NEWMAN	16.00	0.88	5.8
OTC	18.25	9.50	BROOKTROUT TECHNOLOGY	15.75	1.50	10.5
NYS	126.25	76.50	CABLETRON SYSTEMS (H)	121.50	0.88	0.7
OTC	40.25	14.50	CENTIGRAM COMMUNICATIONS (H)	40.25	4.00	11.0
OTC	57.00	27.50	CHIPCOM CORP.	49.25	-0.38	-0.8
OTC	75.88	38.75	CISCO SYSTEMS INC.	72.50	0.00	0.0
OTC	18.38	8.00	COMPRESSION LABS INC.	13.50	0.25	1.9
OTC	36.00	19.50	CROSSCOMM	21.25	-1.50	-6.6
OTC	4.63	1.50	DATA SWITCH CORP.	2.63	0.13	5.0
OTC	8.00	3.25	DIGITAL SYSTEMS INT'L INC.	3.25	-0.25	-7.1
OTC	73.13	24.25	DSC COMMUNICATIONS	53.63	-0.63	-1.2
OTC	8.63	4.00	FIBRONIX INT'L INC.	4.13	-0.25	-5.7
OTC	3.75	0.81	GANDALF TECHNOLOGIES INC. (L)	1.13	0.31	38.4
OTC	2.06	0.69	GATEWAY COMMUNICATIONS	0.91	0.03	3.5
NYS	17.25	7.63	GENERAL DATACOMM INDS.	15.63	0.00	0.0
ASE	3.13	2.00	GO VIDEO	2.50	0.13	5.3
NYS	39.88	31.50	GTE CORP. (L)	33.25	1.25	3.9
NYS	104.25	75.88	ITT CORP. (H)	95.38	-3.88	-3.9
OTC	29.88	20.00	MCI COMMUNICATIONS CORP.	26.25	-0.38	-1.4
OTC	6.38	1.50	MICROCOM INC.	5.38	-0.25	-4.4
OTC	11.25	3.50	NETRIX CORP.	5.88	-0.25	-4.1
OTC	15.75	6.00	NETWORK COMPUTING DEVICES	7.38	-0.63	-7.8
NYS	11.13	5.38	NETWORK EQUIPMENT TECH.	8.25	-0.38	-4.3
OTC	21.88	8.00	NETWORK GENERAL (H)	20.13	0.13	0.6
OTC	12.00	6.88	NETWORK SYSTEMS CORP.	8.63	-0.13	-1.4
OTC	73.88	22.56	NEWBRIDGE NETWORKS CORP.	55.75	-2.25	-3.9
NYS	46.00	21.38	NORTHERN TELECOM LTD.	30.00	0.13	0.4
OTC	35.25	17.00	NOVELL INC.	25.25	1.13	4.7
NYS	48.88	36.63	NYNEX CORP. (L)	37.13	0.25	0.7
OTC	30.00	19.00	OCTEL COMMUNICATIONS CORP.	29.00	0.25	0.9
OTC	18.25	8.75	OPTICAL DATA SYSTEMS INC.	13.50	0.00	0.0
OTC	7.13	3.75	PENRIL DATA COMM NETWORKS	6.25	0.00	0.0
OTC	27.25	13.50	PICTURETEL CORP. (L)	14.63	-0.13	-0.8
OTC	8.25	3.63	PROTEON INC.	6.75	-0.38	-5.3
NYS	38.88	20.13	SCIENTIFIC ATLANTA INC.	26.63	-0.75	-2.7
NYS	47.00	35.75	SOUTHWESTERN BELL CORP.	39.25	1.13	3.0
NYS	40.25	28.13	SPRINT CORP.	37.00	0.13	0.3
OTC	26.75	12.50	STANDARD MICROSYSTEMS CORP.	18.88	0.50	2.7
OTC	19.75	10.25	STRATACOM INC.	15.75	-0.50	-3.1
OTC	42.75	20.00	SYNOPTICS COMMUNICATIONS	25.63	-0.38	-1.4
OTC	11.00	2.88	TELEBIT CORP.	11.00	1.38	14.3
OTC	42.75	17.00	US ROBOTICS (H)	42.75	3.25	8.2
NYS	50.75	39.63	U S WEST INC. (L)	40.63	0.50	1.2
OTC	76.38	36.75	WELLFLEET COMMUNICATIONS	76.38	4.38	6.1
OTC	25.25	7.25	XIRCOM (H)	25.25	1.50	6.3
OTC	30.00	15.25	XYPLEX INC.	17.25	-0.50	-2.8

PCs and Workstations				UP 4.12%		
OTC	5.56	2.50	ADVANCED LOGIC RESEARCH	4.13	0.25	6.5
OTC	59.13	22.00	APPLE COMPUTER INC.	36.00	-0.25	-0.7
OTC	33.00	12.75	AST RESEARCH INC.	31.75	0.50	1.6
NYS	5.63	2.50	COMMODORE INT'L	3.13	0.00	0.0
NYS	99.00	41.75	COMPAQ COMPUTER CORP. (H)	99.00	5.25	5.6
OTC	39.13	13.50	DELL COMPUTER CORP.	24.63	4.13	20.1
OTC	25.00	16.75	GATEWAY 2000 INC.	23.88	1.50	6.7
NYS	91.38	64.38	HEWLETT PACKARD CO. (H)	91.38	2.50	2.8
NYS	26.00	11.75	SILICON GRAPHICS	24.38	-0.50	-2.0
OTC	36.50	21.13	SUN MICROSYSTEMS INC.	27.25	1.50	5.8
NYS	50.75	24.63	TANDY CORP.	42.88	1.25	3.0
OTC	5.63	2.50	ZEOS INTERNATIONAL LTD.	3.25	0.00	0.0

Large Systems				OFF 0.69%		
ASE	8.25	4.38	AMDAHL CORP.	5.75	-0.13	-2.1
NYS	7.25	3.63	CONVEY COMPUTER	6.00	-0.38	-5.9
OTC	4.88	1.88	CRAY COMPUTER	2.00	-0.25	-11.1
NYS	32.25	20.38	CRAY RESEARCH INC.	30.25	-0.25	-0.8
NYS	13.88	7.63	DATA GENERAL CORP. (L)	8.00	0.25	3.2
NYS	48.25	28.25	DIGITAL EQUIPMENT CORP. (L)	29.13	0.50	1.7
NYS	51.63	33.88	HARRIS CORP. (H)	50.63	-0.13	-0.2
NYS	60.00	40.63	IBM	52.75	0.25	0.5
OTC	25.75	3.63	KENDALL SQUARE RESEARCH	4.75	-1.00	-17.4
NYS	167.00	87.25	MATSUSHITA ELECTRONICS (H)	167.00	5.50	3.4
OTC	18.75	12.75	NETFRAME	15.63	-0.63	-3.8
OTC	26.00	9.25	PARALLAN COMPUTER	10.00	-0.50	-4.8
OTC	23.25	11.25	PYRAMID TECHNOLOGY	13.75	-0.75	-5.2
OTC	23.25	11.25	SEQUENT COMPUTER SYS.	14.75	0.50	3.5
OTC	6.19	1.75	SEQUOIA SYSTEMS INC.	6.00	0.69	12.9
NYS	41.25	20.25	STRATUS COMPUTER INC.	28.75	-0.63	-2.1
NYS	14.88	8.50	TANDEM COMPUTERS INC. (H)	14.88	1.75	13.3
OTC	30.00	10.63	TRICORD SYSTEMS	20.75	0.00	0.0
NYS	15.25	9.88	UNISYS CORP.	14.50	0.25	1.8

Software				OFF 0.37%		
OTC	37.00	16.25	AADOBE SYSTEMS INC.	29.25	-0.75	-2.5
OTC	27.75	13.50	ALDUS CORP.	22.00	1.88	9.3
OTC	8.88	5.13	AMERICAN SOFTWARE INC.	5.88	-0.25	-4.1
OTC	28.13	8.00	ASK COMPUTER SYSTEMS	8.38	0.25	3.1
OTC	58.00	37.00	AUTODESK INC.	58.00	6.25	12.1
OTC	4.50	2.38	BACHMAN INFO. SYSTEMS	3.25	-0.13	-3.7
OTC	41.00	24.00	8GS SYSTEMS INC.	25.00	-0.50	-2.0
OTC	69.50	38.75	8MCS SOFTWARE INC. (H)	69.00	3.75	5.7
OTC	28.25	20.38	BOOLE & BABBAGE	23.50	-0.38	-1.6
OTC	27.25	12.00	BORLAND INT'L INC. (L)	12.63	0.25	2.0
OTC	4.63	2.75	CE SOFTWARE	3.00	0.00	0.0
ASE	40.50	18.50	CHEYENNE SOFTWARE INC.	40.50	1.50	3.8
OTC	14.25	6.00	COGNOS INC.	10.75	-1.13	-9.5
NYS	44.88	21.88	COMPUTER ASSOCIATES	37.13	-1.38	-3.6
NYS	6.13	2.13	COMPUTERVISION CORP.	4.00	-0.50	-11.1
OTC	36.00	19.25	COMPUWARE CORP. (H)	34.75	0.00	0.0
OTC	12.25	5.75	COMSHARE INC.	10.50	-0.75	-6.7
OTC	22.00	6.13	COREL CORP.	19.00	0.00	0.0
OTC	11.25	3.38	EASEL CORP.	4.38	0.13	2.9
OTC	25.50	8.75	FILENET CORP.	22.75	-0.25	-1.1
OTC	25.00	10.75	4TH DIMENSION	12.13	0.38	3.2
OTC	14.25	5.25	FRAME TECHNOLOGY	8.63	-0.75	-8.0
OTC	17.00	7.00	GROUP I SOFTWARE	9.25	-1.75	-15.9
OTC	31.00	13.50	GUPTA	30.88	3.13	11.3
OTC	12.00	6.13	HOGAN SYSTEMS INC.	10.00	-0.13	-1.2
OTC	29.50	11.25	IMRS	26.50	-0.25	-0.9
OTC	44.75	24.00	INFORMATION RESOURCES	28.00	0.63	2.3
OTC	27.25	13.38	INFORMIX CORP.	23.00	1.50	7.0
OTC	12.75	8.50	INTERGRAPH CORP.	10.00	-0.63	-5.9
OTC	10.75	4.88	INTERLEAF INC.	7.38	-0.13	-1.7

KEY: (H) = NEW ANNUAL HIGH REACHED IN PERIOD (L) = NEW ANNUAL LOW REACHED IN PERIOD
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EXCH 52-WEEK RANGE FEB. 25 Wk NET Wk PCT 3PM CHANGE CHANGE

OTC	13.25	4.75	INTERSOLV INC.	12.25	0.13	1.0
OTC	18.75	7.75	KNOWLEDGEWARE INC.	12.38	-1.38	-10.0
OTC	47.25	15.50	LEGENT CORP.	25.63	1.13	-4.2
OTC	69.63	23.50	LOTUS DEVELOPMENT (H)	69.00	2.25	3.4
OTC	19.75	4.25	MATHSOFT	6.13	-0.63	9.3
OTC	10.75	4.50	MCAFFEE ASSOCIATES	8.50	-0.25	-2.9
OTC	15.50	7.88	MENTOR GRAPHICS	12.88	0.13	1.0
OTC	37.50	13.13	MICRO FOCUS	14.38	-0.38	-2.5
OTC	11.63	4.38	MICROGRAFX INC.	9.50	-0.25	-2.6
OTC	98.00	70.38	MICROSOFT CORP.	80.50	0.75	0.9
OTC	37.75	15.63	ORACLE CORP.	32.13	-1.38	-4.1
OTC	44.75	22.50	PARAMETRIC TECHNOLOGY	31.50	-2.75	-8.0
OTC	39.50	26.00	PEOPLESOFT	29.63	-0.88	-2.9
OTC	5.88	3.50	PHOENIX TECHNOLOGIES	4.50	-0.25	-5.3
OTC	60.50	22.00	POWERSOFT	56.50	1.50	2.7
OTC	39.75	10.75	PLATINUM SOFTWARE	10.88	-0.88	-7.4
OTC	17.75	7.25	PLATINUM TECHNOLOGY	13.00	0.38	3.0
OTC	60.25	32.25	PROGRESS SOFTWARE CORP.	41.13	2.00	5.1
OTC	4.25	1.94	QUARTERDECK OFFICE SYS.	2.94	0.75	34.3
OTC	32.00	17.00	RAINBOW TECHNOLOGIES INC.	20.00	-0.50	-2.4
OTC	11.38	4.25	RASTEROPS	7.88	-0.13	-1.6
OTC	15.25	4.50	ROSS SYSTEMS	5.50	-0.25	-4.3
OTC	28.75	13.25	SAPIENS INTL. CORP. N.V. (L)	14.38	0.50	3.6
OTC	9.13	3.13	SOFTKEY SOFTWARE PRODUCTS	4.75	0.00	0.0
OTC	14.50	5.50	SOFTWARE PUBLISHING CORP.	6.50	-0.63	-8.8
OTC	17.25	6.38	SOFTWARE TOOLWORKS INC.	9.50	-0.13	-1.3
OTC	2.88	1.19	SPINNAKER SOFTWARE	2.16	0.00	0.0
OTC	13.75	6.25	STATES OF THE ART	6.63	-0.13	-1.9
NYS	35.63	17.63	STERLING SOFTWARE INC.	32.38	0.63	2.0
OTC	21.63	12.00	STRUCT. DYNAMICS RESEARCH	14.75	1.00	7.3
OTC	48.00	25.38	SYBASE INC.	43.50	-2.50	-5.4
OTC	20.50	9.25	SYMANTEC CORP.	13.63	-0.50	-3.5
OTC	52.75	25.75	SYNOPSYS	45.00	1.25	2.9
OTC	24.25	11.50	SYSTEM SOFTWARE ASSOC.	16.00	2.13	15.3
OTC	6.75	2.88	TRINZIC CORP.	5.13	-0.31	-5.8
OTC	29.00	13.50	VIEWLOGIC SYSTEMS	27.25	0.00	0.0
OTC	12.25	5.50	WALKER INTERACTIVE SYSTEMS	10.50	0.25	2.4
OTC	21.88	14.00	WANG LABORATORIES INC.	18.00	0.13	0.7
OTC	2.56	0.84	WORDSTAR	1.38	0.00	0.0

INDUSTRY PULSE: PC software

Estimated 1993 Top 10 worldwide PC applications by revenue

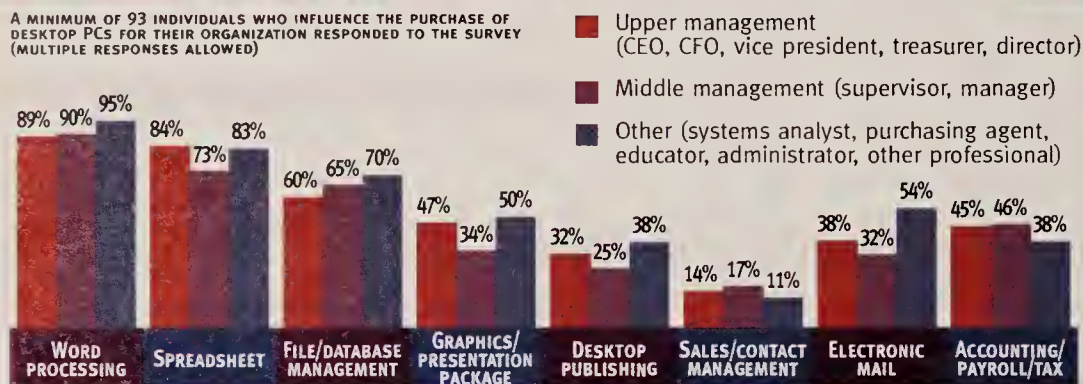
Application	Revenue	Units
Microsoft Corp.'s Office for Windows	\$493M	1.6M
Microsoft's Word for Windows	\$407M	2.7M
WordPerfect Corp.'s WordPerfect for Windows	\$390M	2.9M
Microsoft's Excel for Windows	\$292M	2.1M
Lotus Development Corp.'s 1-2-3 for DOS	\$257M	1.4M
Lotus' 1-2-3 for Windows	\$207M	1.2M
WordPerfect's WordPerfect for DOS	\$204M	1.9M
Microsoft's Office Professional for Windows	\$177M	.5M
Lotus' 1-2-3 Notes	\$149M	.6M
Borland International, Inc.'s dBase IV	\$117M	.74M

Preliminary estimates. Individual application numbers do not include sales within suites. For example, the Excel number is exclusive of the units sold as part of Microsoft Office.

Source: Dataquest, Inc., San Jose, Calif. (December 1993)

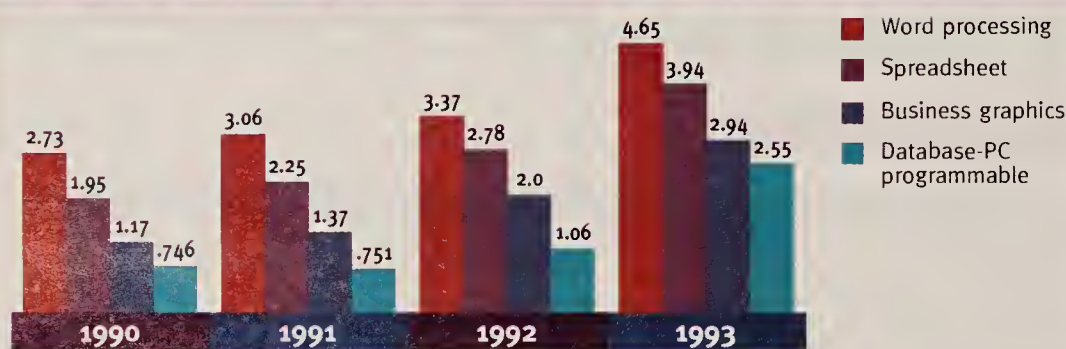
What types of software applications do you use regularly?

A MINIMUM OF 93 INDIVIDUALS WHO INFLUENCE THE PURCHASE OF DESKTOP PCs FOR THEIR ORGANIZATION RESPONDED TO THE SURVEY (MULTIPLE RESPONSES ALLOWED)



Source: IntelliQuest, Inc., Austin, Texas (December 1993)

U.S. unit PC sales, non-Unix software (in millions)



Source: InfoCorp MarketModel, Santa Clara, Calif. (January 1994)

The 5th Wave by Rich Tennant



Inside Lines

So sue me

Stac Electronics' feisty President and CEO Gary Clow said his testimony in the Stac/Microsoft patent infringement case was thrown out because he mentioned that Bill Gates was the second-richest man in America. The judge had earlier ruled in favor of a Microsoft motion that any mention of the wealth of any individual at Microsoft get prior approval; Clow said he didn't know about that stipulation.

Overhead slam

IBM has encountered some major performance problems in its initial testing of usage-based mainframe software pricing with 600 customers [CW, Feb. 21]. Heavy overhead caused by the usage-tracing tools on applications such as DB2 and IMS has degraded performance by as much as 60% in some cases, Linda Hubbard, manager of IBM's software business strategy, said at the Share users group meeting in Anaheim, Calif., last week. IBM is still looking for a fix to get the overhead down, Hubbard added. Users at the conference said they expect to see price breaks if the tools take up a noticeable amount of processing power.

The best defense is a good server

Defense contractor Hughes Aircraft in El Segundo, Calif., will announce next week plans to spend \$70 million dollars (80% for support, development and training) in a five-year overhaul of its companywide production computing systems beginning in April. The project's goal is to create a common client/server engineering system for 50 sites and 20,000 users that lets those users access any data from any site, according to a company spokeswoman. At the heart of the overhaul is Product Data Management software from Sherpa Corp. in San Jose, Calif. The software, which is built on an Ingres database, will allow Hughes Aircraft employees to access product data from a distributed database.

Uniface for you

Uniface plans to step into the end-user report writer circle today with three new Personal Access Series graphical query tools, a source close to the company said. Uniface already sells Reporter, a more complicated reporting product aimed at developers. Personal Access tools were designed to let PC users manipulate information stored in Oracle, Sybase and other relational databases. Gupta recently unveiled its own end-user reporting tools.

Sun plans spring comeback

Sun Microsystems is planning a spring low-end workstation offensive, partly to keep up with new low-end entries from rivals Hewlett-Packard and Silicon Graphics, industry sources said last week. New packaging and some glitzy options, such as flat-panel displays — and possibly infrared communications ports — are expected, sources said. The new machines are enhanced versions of the SPARCclassic and SPARCstation LX with Fujitsu Ltd.'s micro-SPARC II chips that reportedly operate at 70 MHz or more. The low-end units should be nearly twice as fast as previous models, sources said.

Oracle wasn't happy recently when a report surfaced on the Internet of a virus in office automation product Office 2.0, free copies of which were given out at an annual users conference in September. It appears the reports were wrong. There was no virus, and Office 2.0 seems to work smoothly, according to several users. "That's the trouble with the information highway," said Matt Reagan, an Oracle user. "That mistake probably circled the globe eight times on the Internet before someone caught it." Now you can also use the Internet to send news tips to Computerworld. Phone, fax or CompuServe News Editor Maryfran Johnson with news tips at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Send tips via MCI Mail at 590-8017 or on the Internet at mjohnson@cw.com. Or try Computerworld's 24-hour voice-mail tip line at (508) 820-8555.

WHEN A LAWYER AT GM'S HQ IN ZURICH IS WORKING ON A DOCUMENT IN CONJUNCTION WITH STAFF IN LONDON, PARIS AND ANTWERP, ALL HAVE ACCESS TO THE SAME INFORMATION VIA NOTES. AND WITH NOTES, ALL TEAM MEMBERS CAN CONTRIBUTE AND KEEP UP TO DATE.



GM SALESPEOPLE CARRY LAP-TOP COMPUTERS WITH LOTUS NOTES WHEN THEY MAKE A CALL, THEY CAN RECONNECT TO MAKE SURE THEY'RE DEALING WITH THE LATEST PRODUCT INFORMATION. AT THE SAME TIME, ANY ISSUES THAT ARISE IN THE FIELD CAN BE COMMUNICATED THROUGH NOTES SO PEOPLE BACK AT HEADQUARTERS CAN REACT QUICKLY.

To aggressively meet the challenges of competing in a "Unified Europe," General Motors Europe has streamlined, with the help of EDS, a Lotus Notes Business Partner. Central to this new structure is Lotus Notes, the vanguard of a new category of software called groupware.

GENERAL MOTORS USES NOTES TO UNIFY EUROPE. HOW BIG IS YOUR PROBLEM?

GM Europe is as large and complex as some countries. With over 100,000 people, plus 6,500 dealers, it operates across 18 languages and countless

networks. With multinational divisions including Opel, Vauxhall and Saab, GM boasts two of the fastest growing car lines in Europe.

Lotus Notes® unique teamwork capabilities and rich data management facilities allow GM to carry out

time-sensitive contractual and developmental work by teams dispersed across the continent. To share financials. To improve manufacturing standards. To upgrade dealer service. To track market trends. And finally, to accelerate key business processes.

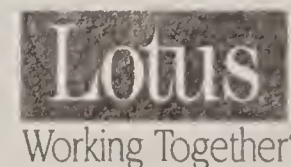
According to Pat Hickey, GM Europe's OIS Information Manager, "Notes is

the forum for exchanging information and ideas to make us more competitive. Choosing it is one of the most popular decisions we've ever made."

Today, operations are so efficient that the entire European continent is run from a central office of just 200 people and so effective that General Motors has grown from #5 in Europe to #2 over the last few years.

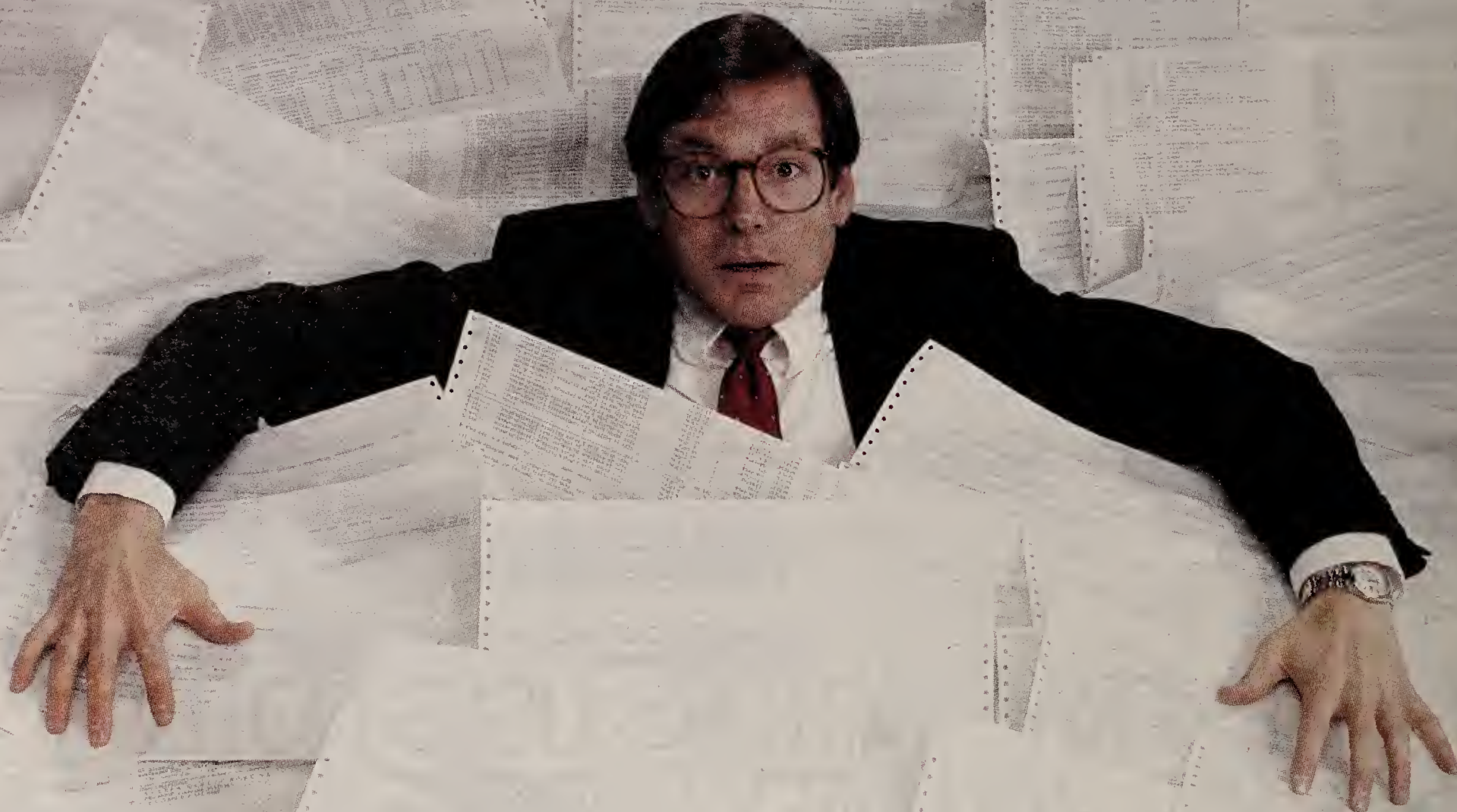
Now plans are underway to get approximately 40,000 Notes users online in the US by 1996. Evidently, what's good for General Motors Europe, is good for America.

To learn what Lotus Notes can do for your company, **call for our free video: The Executive Guide to Lotus Notes.** Or to find out about becoming a Lotus Authorized Business Partner, call **1-800-828-7086, ext. 9534***



*In Canada call 1-800-GO-LOTUS. CMEurope worked with Lotus' Business Partner EDS. Contact: Jane Barnford, EDS Technical Products Division, Wavendon Tower, Wavendon, Milton Keynes, MK178LX, England 44(0)908 585858. In the USA, contact: J. Andice Gannon, EDS, 905 Southland, 1028 Lansing, Michigan 48910, (517) 885-3502. ©1994 Lotus Development Corporation, 55 Cambridge Parkway, Cambridge, MA 02142. All rights reserved. Lotus Notes and Working Together are registered trademarks of Lotus Development Corporation. All company names are registered trademarks and trademarks of their respective companies.

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